

ABSTRACT

SMITH, KATHLEEN NICOLE. Career Narratives of Future K-12 STEM Teachers in the North Carolina Teaching Fellows Loan Forgiveness Program. (Under the direction of Dr. Joy Gaston Gayles and Dr. Paul Umbach).

This narrative case study features an in-depth exploration of the career experiences and decisions of 10 participants in the recently reinstated North Carolina Teaching Fellows Program (NCTFP). The NCTFP incentivizes talented postsecondary students' entry and retention into teaching careers in STEM and special education by providing selected students with up to \$8,250 per year in forgivable loan funding. Forgivable loans must be paid back after graduation, either through qualifying teacher service in North Carolina public schools or in cash with interest within 10 years of degree completion. Program participants must attend one of five partner campuses and complete enrichment activities in preparation for teaching careers.

The present study employs social cognitive career theory and concepts drawn from behavioral economics to understand the development of participants' career interests over their life course and students' decisions to participate in the NCTFP. Findings suggest that for most participants, interests in teaching careers began very early in life, long preceding the introduction of the NCTFP. Overall, the NCTFP was most appealing to students whose existing career goals already fit program requirements, as these participants saw minimal costs and maximal benefits to participating in the program. Students who changed their career plans to participate in the program incurred larger proximal costs and may demonstrate lower commitment to these career goals. Findings demonstrate that the upfront forgivable loan money granted by the NCTFP was the most compelling aspect to participants' decisions to participate in the program. This funding motivated several participants to alter their college and career plans to participate, enabling some students to access and justify preferred college choices. The NCTFP further recruited two participants who hadn't originally planned to enter teaching into the career, although the contexts

of these respective decisions were complex and not initially driven by students' intrinsic interests to teach. The two participants who are planning to teach as a result of the NCTFP are also the least committed to staying in the profession long-term among study participants.

Although the NCTFP offers reduced loan forgiveness service terms for participants who enter teaching positions in low-performing schools, this component of the policy was only a compelling motivator among participants most eager to finish their teaching service quickly, a dynamic that could be problematic for promoting teacher retention within low-performing schools. Participants' ideas about the type of school where they will pursue employment were typically the least developed part of their future goals; participants frequently expressed uncertainty about what teaching at a low-performing school might entail.

While participants universally expressed a high degree of confidence that they would fully meet NCTFP post-graduate service requirements, participants also demonstrated a limited understanding of all policy components, both at the time of their commitment to the program and at the time of this research. Although NCTFP assumes stable career interests and goals over time, time-inconsistent preferences points to the difficulty of predicting the preferences of one's future self, especially for students making complex decisions based on limited professional and career experience. Thus, while NCTFP participants reap proximal program benefits that allow them to meet college-going goals and reduce college expenses, the costs of the program remain distal and could have significant financial ramifications for participants if program terms are unfulfilled. This paper concludes with implications and recommendations for the NCTFP and similar forgivable loan policies designed to promote teacher recruitment in shortage areas.

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Career Narratives of Future K-12 STEM Teachers in the North Carolina Teaching Fellows Loan
Forgiveness Program

by
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TABLE OF CONTENTS

LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
CHAPTER 1: INTRODUCTION.....	1
STEM teacher demand	1
North Carolina STEM teacher demand	3
North Carolina Teaching Fellows Program.....	4
Implementation of the NCTFP	5
Research problem: Loan forgiveness requirements.....	9
Loan forgiveness through teaching.....	9
Teacher demand.....	12
Purpose of study	14
Research questions	15
Overview of theoretical frameworks	16
Social cognitive career theory	17
Behavioral economics.....	17
Overview of methodology	19
CHAPTER 2: LITERATURE REVIEW.....	20
Teacher shortages	22
STEM teacher preparation and workforce.....	26
Academic achievement.....	29
Gender and race	30
Teacher compensation	31
Teacher compensation in North Carolina.....	35
Economic incentives to recruit teachers	36
Loan forgiveness programs	37
North Carolina Teaching Fellows Program.....	46
1987-2011 North Carolina Teaching Fellows Program	47
2018-2019 North Carolina Teaching Fellows Program	54
Career development and decisions	71
College students and careers	71
An example: Teach for America.....	77
Theoretical frameworks.....	80
Social cognitive career theory.....	81
Behavioral economics and bounded rationality	86
CHAPTER 3: METHODOLOGY.....	95
Narrative case study.....	95
Narrative inquiry.....	96
Case study.....	99
Institutional profiles.....	99
Elon University.....	100
Meredith College	103
NC State University.....	104
UNC Chapel Hill	105
UNC Charlotte.....	106

Recruitment	107
Sampling	108
Participants	109
Data collection	111
Initial interview	112
Second interview	115
Supplementary materials	116
Program stakeholder interviews	117
Analysis	117
Thematic narrative analysis	118
Category-centered analysis	119
Trustworthiness	119
Positionality statement	122
Limitations	123
CHAPTER 4: PARTICIPANT PROFILES AND NARRATIVE THEMATIC ANALYSIS ..	126
Participants	126
Participant Profiles	129
Monica	129
Victoria	130
Taylor	131
Christy	132
Zoe	133
Jenna	134
Matilda	135
Kristen	136
Kyle	137
Felicity	138
Narrative thematic analysis	140
Monica	140
Early interests: “I would always play teacher”	140
Teaching goals: “I want to become an English teacher”	141
Senior project: “I published a children’s book”	142
Financing college: “It’s a normal thing to take out loans”	143
Choosing a college: “Everything aligned so well”	143
Special education: “We don’t have that program”	146
NCTFP experience: “The amount of opportunities I get”	146
Future plans: “Keeping my options open”	147
Victoria	147
Early interests: “I always knew I wanted to be a teacher”	147
Teacher role models: “I want to be a teacher just like him”	148
Choosing teaching: “This is more than it appears to be on the outside”	149
College cost: “The most important thing”	150
The NCTFP: “I can go to a four-year university now”	151
Teaching at a low-performing school: “Pay it back quicker”	154
Taylor	155
Early interests: “It was fun pretending to be a teacher”	155
Teacher encouragement: “Super empowering”	155

Choosing teaching: “Math education and music education”	156
College choice: “I want to go there”	158
Teaching Fellows: “You pretty much graduate with job security”	158
Future plans: “I’m probably going to end up staying in North Carolina”	160
Christy	161
Early interests: “I was always messing with the computer”	161
STEM middle school: “Everything started taking off for me”	161
Information technology in high school: “I continued on my STEM”	162
College choice: “I don’t want student debt for you”	163
NCTFP: “I still wasn’t sold on teaching”	164
Mom’s career: “I’ve known so much about teaching because of my mom”	166
NCTFP experience: “Really, really fun for me”	167
Future plans: “Industries focused on technology and design”	167
Zoe	170
Early interests: “I was one of those kids that did well in school”	170
Family: “They’re all helping people, I want to help people”	170
Science: “It was never really my thing”	171
Teacher support programs: “If I do science, I can get the money”	171
College choice: “Closing the private school gap”	173
Future plans: “I want to get into a school where I can start something”	174
Jenna	176
Family: “They support me in everything”	176
Early interests: “I’ve always wanted to be a teacher”	177
College choice: “You can get into clinicals freshman year”	178
Middle grades math: “I didn’t even know that was a thing”	178
Financing college: “I applied to as many scholarships as I could”	179
Future plans: “I’m only getting the scholarship for this year and next”	181
Matilda	182
Early interests: “I was always the teacher”	182
Chemistry: “The one subject that I had to work at”	182
Teaching: “Maybe I should go into a more stable career”	183
Major choice: “What can I do that’s fun-ish and will make me money?”	185
NCTFP: “I’m STEM, so I should try it”	186
Teacher preparation: “I am definitely getting better”	188
Low-performing schools: “I don’t know if I’m good enough”	188
Future plans: “There’s nothing else I want to do”	189
Kristen	190
Mom in teaching: “I always had that presence in my life”	190
Teaching: “It was always in the back of my mind”	191
Choosing teaching: “It’s always been math”	192
College choice: “I really had no idea what I wanted”	193
Middle grades: “My end goal is to be able to bring my classroom outdoors” ..	194
NCTFP: “The money was really compelling”	195
Teaching in North Carolina: “I need to get the experience anyway”	196
Kyle	198
Early interests: “I always liked technical things”	198
College choice: “The best opportunity and the lowest cost”	199
Engineering: “I’m not enjoying it and not doing well”	200

Technology education: “All the fun stuff without the math”	200
NCTFP: “I thought it was just a scholarship”	201
Future plans: “It would just depend on the financials”	204
Low-performing schools: “The shortest option”	205
Felicity	207
Early interests: “I’ve always wanted to be a teacher”	207
Original NCTFP: “One of the chances I had to be able to afford college”	208
Math education: “Combine two things I really like”	208
Full college scholarship: “Made my decision for me”	209
Teaching: “You could do so much more”	209
American Indian studies and math: “Just to keep all my options open”	211
Choosing teaching: “I want to be a math teacher”	213
New NCTFP: “Whoa, that’s me”	214
CHAPTER 5: CATEGORY-CENTERED FINDINGS	216
Development of interest in teaching STEM education	217
Personal performance and accomplishments	218
Vicarious learning	226
Social persuasion	233
Physiological and affective states	240
NCTFP costs and benefits, bounded rationality, and student decision making	243
Neutral cost of applying: “Why not?”	247
Financial benefits: “You need to take the money”	249
Non-financial benefits: “There was so much more to be excited about”	249
Proximal costs: Academic and college decisions	256
Distal costs: Post-graduate teaching service	259
Bounded rationality	264
Information access and processing	264
Framing effects	275
Time-inconsistent preferences	278
Summary	284
CHAPTER 6: DISCUSSION	288
Discussion of major findings	290
Recruiting students into teaching	291
Recruiting non-education students	298
Recruiting students into STEM education	300
Retaining North Carolina education talent	303
Program name and reputation	304
Future plans and time-inconsistent preferences	306
Low-performing school incentives and unintended consequences	309
Implications for policy	311
Increase teacher pay	312
Clarify NCTFP mission to recruit retainable teachers	314
Availability and accessibility of information	317
More enrichment opportunities	321
Alternative incentives for low-performing schools	322

Strategies for increasing program access and diversity	324
Reduce distal program costs and loan terms	330
Data and longitudinal outcome tracking.....	333
Implications for theory	334
Future research	340
Summary.....	344
REFERENCES	348
APPENDICES	385
Appendix A: Federal loan forgiveness programs for teachers	386
Appendix B: Gatekeeper recruiting email	387
Appendix C: Initial interest survey for participation.....	389
Appendix D: Participant communication	392
Appendix E: Informed consent form	395
Appendix F: Interview timelining activity instructions.....	397
Appendix G: Interview protocol.....	398
Appendix H: Education history/demographic survey	400
Appendix I: Participant timelines	402
Appendix J: Second interview protocol.....	414
Appendix K: Optional supplementary materials submitted	415
Appendix L: Protocol for NCTFP campus coordinator interviews.....	416
Appendix M: Primary source of information for learning about the new NCTFP.....	417

LIST OF TABLES

Table 1.1	Original and new North Carolina Teaching Fellows Program criteria	8
Table 2.1	Institutional partners for the original NCTFP	50
Table 2.2	Number of Teaching Fellows by campus	57
Table 2.3	Undergraduate demographic distributions of NCTFP partner institutions	59
Table 2.4	NCTFP eligibility requirements and funding totals	62
Table 2.5	NCTFP enrichment activities	68
Table 3.1	Profiles of NCTFP partner institutions	100
Table 3.2	Number of Teaching Fellows by campus	101
Table 3.3	2018-2019 NCTFP participants by demographics and subject area	110
Table 4.1	Participant demographic information	127
Table 4.2	Participant academic information	128
Table 5.1	Themes for participants' development of self-efficacy in teaching	217
Table 5.2	Rational choice and bounded rationality in NCTFP participation decisions	245
Table 5.3	Influence of the NCTFP on participants' academic plans	247
Table A1	Federal loan forgiveness programs for teachers	386
Table A2	Optional supplementary materials submitted	415
Table A3	Primary source of information for learning about the new NCTFP	417

LIST OF FIGURES

Figure 2.1 Social cognitive career theory 83

CHAPTER 1

INTRODUCTION

For over 35 years, North Carolina has experienced K-12 teacher shortages, especially in subject areas such as science, technology, engineering, and math (STEM; Cross, 2016). These trends are not unique to the state; schools throughout the U.S. have long reported an inadequate supply of qualified K-12 teachers to meet educational demands, with concern for this issue continuing to grow (Carver-Thomas & Darling-Hammond, 2017b; Cross, 2016; Sutcher, Darling-Hammond, & Carver-Thomas, 2016). Over the past five years, colleges across the U.S. have seen a 35% overall decrease in undergraduate enrollment in teacher preparation programs (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics [NCES], 2017; Sutchter et al., 2016), with North Carolina institutions showing a similar downward trend (Bastian & Watts, 2016). Teacher shortages in STEM fields are particularly severe nationwide, as these subjects are among the most difficult for schools to fill with qualified candidates (Marder, Brown, & Plisch, 2017; NCES, 2012; Podgursky & Springer, 2011; Sutchter et al., 2016).

STEM Teacher Demand

The term “teacher shortage” is used in reference to an inadequate supply of teachers based on demand (Cross, 2016). Factors that contribute to this imbalance include growing student enrollment, teacher turnover and retirement, and declining student-teacher ratios (Sutchter et al., 2016). Although teacher shortages in STEM subjects are not new (Cross, 2016), a heightened attention to STEM education across the U.S. over the last decade has led to an even greater demand for qualified teachers in these subject areas (Ingersoll & Perda, 2010; Marder et al., 2017). In his 2011 State of the Union address, for example, former President Barack Obama highlighted the U.S.’s lagging performance in science and math subjects in comparison to other

developed countries and announced a goal to prepare 100,000 new teachers in STEM fields over the next decade (The White House, 2011). This call to action cited concerns about the U.S.'s economic competitiveness in STEM skills and knowledge, as well as anticipated workforce needs in STEM industries and in education alike.

In response to political attention and a changing economy that features significant job growth in STEM fields (Fayer, Lacey, & Watson, 2017; Langdon, McKittrick, Beede, Khan, & Doms, 2011), the improvement of STEM education in the U.S. has become a national imperative (Carmichael, 2017; National Science Board [NSB], 2015, 2016). Policymakers at all levels have responded and many states, including North Carolina, have developed strategies for supporting and enhancing STEM education (Carmichael, 2017; North Carolina Department of Public Instruction [NCDPI], 2011). In 2011, North Carolina developed a strategic plan “to ensure a workforce that is prepared for the high-skill, high-wage, and high-demand jobs of a knowledge-based and innovation economy” (NCDPI, 2011, p. 2). Within the state’s strategic plan, North Carolina aimed to increase student, educator, and institutional STEM achievement, aligning postsecondary education with the state’s workforce needs in these fields. As a result, one important STEM education goal in North Carolina is to “increase the number of teachers prepared and delivering integrated STEM education” (NCDPI, 2011, p. 6).

Importantly, teacher shortages are not only unequally distributed across subjects, but also across schools. Shortages of qualified and effective teachers across the U.S., especially in high-demand subjects, are more prevalent among low-performing, low-income, and high-minority schools (Aragon, 2016; BEST NC, 2018; Clotfelter, Ladd, & Vigdor, 2011; Ingersoll & Perda, 2010; Marder et al., 2017; NSB, 2015, 2016). Schools that fit these descriptors tend to have more limited resources for instructional spending, lower teacher salaries, offering less time for teacher collaboration while assigning a higher teacher workload (Borman & Dowling, 2008; Feng, 2009;

Hornig, 2009; Guarino, Santibañez, Daley, 2006; Simon & Johnson, 2015; Staklis & Henke, 2013; Struyven & Vanthournout, 2014; Sutchter et al., 2016). Within North Carolina, low-income and low-performing schools tend to offer lower salaries as well (North Carolina Association of County Commissioners [NCACC], 2017), a factor consistently associated with difficulty in recruiting and retaining qualified and talented teachers (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009; Feng & Sass, 2018; Gilpin & Kaganovich, 2012; Guarino et al., 2006; Hendricks, 2014, 2015; Imazeki, 2005; Leigh, 2012; Rickman, Wang & Winters, 2017).

North Carolina STEM teacher demand. North Carolina is one of 40 states experiencing STEM teacher shortages, with concern about this demand receiving greater attention in recent years given the declining enrollment of postsecondary students in the state's teacher preparation programs (Bastian & Watts, 2016) and the continued attention to and emphasis on STEM education at state and national levels (Carmichael, 2017; NCDPI, 2011; NSB, 2015, 2016; The White House, 2011). Mirroring national trends, the University of North Carolina (UNC) system, the state's system of public four-year universities, saw a 30% decrease in undergraduate and graduate student enrollment in teacher preparation programs between 2010 and 2015 (Bastian & Watts, 2016). While enrollment increased slightly from 2015 to 2016, 2017 enrollment dipped even lower than it had been in 2015 (UNC System, n.d.). As the UNC system serves as the largest producer of teachers for North Carolina's public schools (Bastian & Xing, 2016; NCDPI, 2018), declining teacher preparation program enrollments have led to growing concerns about the teacher workforce pipeline within the state. From 2011-2014, 42.9% of new teachers in the state came from the teacher preparation programs in the UNC system, with an additional 11.5% coming from teacher preparation programs at private institutions within North Carolina (Bastian & Xing, 2016).

Teacher shortages are not new to North Carolina, especially in STEM—the state has experienced teacher shortages in STEM secondary education since the 1980s (Cross, 2016). Data from recent years demonstrate that high school math is proportionately the hardest subject area for the state to staff with qualified teachers, followed by K-12 special education and high school science (BEST NC, 2018), although the state sees the most vacancies in elementary education due to the higher number of elementary education teaching positions (NCDPI, 2019). Reflective of demand, graduates from teacher education programs with specializations in STEM subjects and special education have the highest job placement rates among all graduates preparing to become teachers within the UNC system (Bastian, 2015). One faculty member at an institution in the UNC system remarked that it was common for undergraduate students in STEM education subjects to receive job offers during the course of their senior year, sometimes even prior to their student teaching experiences (E. Horne, personal communication, August 21, 2018).

North Carolina Teaching Fellows Program

A North Carolina policy response to the need for STEM and special education teachers is the redesign and implementation of a previously popular teacher recruiting initiative within the state, the North Carolina Teaching Fellows Program (NCTFP). First implemented in the 2018-2019 academic year, the new NCTFP resembles its 1987-2011 predecessor of the same name but was implemented on a much smaller and more restricted scale. Instead of broadly recruiting teachers, the new NCTFP focuses on increasing the number of students preparing for teaching careers in the state's most needed subject areas, STEM and special education, while additionally incentivizing their entry into teaching positions in low-performing schools. Below, I will briefly describe the concept for and outcomes of the original NCTFP, followed by the new program's structure and objectives that contextualize the present study. For a quick comparison of the original and new North Carolina Teaching Fellows programs, see Table 1.1.

Implementation of the NCTFP. The original NCTFP was created by a coalition titled the Public School Forum of North Carolina (PSFNC, also the “Forum”), in response to similar teacher shortage issues that the state faces today. In anticipation of teacher retirements, teacher attrition, declining enrollment of college students in teacher preparation programs, and increasing student enrollment, the Forum identified a great need for increasing the size and quality of North Carolina’s teacher workforce (PSFNC, 1986). In a 1986 report, the Forum proposed their initial vision for the NCTFP in the context of two priorities: meeting the state’s demand for teachers over the next decade and the need to counter the “declining appeal of the teaching profession” in order to recruit high-ability students into teaching (PSFNC, 1986, p. 6). Considering these constraints, the Forum suggested that North Carolina adopt a new policy in the form of grants “treated as loans” (PSFNC, 1986, p. 7) to incentivize incoming high-achieving college students to enter teaching careers. As a result of these suggestions, the NCTFP was born.

The original NCTFP operated for over three decades, ending as a result of significant budget cuts in the state, with the final cohort admitted in 2011 and funded through their 2015 graduation (Cohen, 2015; Fitzsimon, 2015). Over the original NCTFP’s duration, the program partnered with 17 North Carolina institutions to admit over 10,700 undergraduate Fellows, up to 500 annually (Cohen, 2015). At the time the program was defunded, Fellows were given up to \$6,500 per year for up to four years with the stipulation that the funding be paid back in qualifying teaching service at a public school within the state (one year of qualifying service relieved one year of scholarship money received) within 10 years of the Fellow’s graduation. If eligible service was not completed, Fellows were required to pay back funding in cash with 10% interest (Cohen, 2015). In addition to financial support, Fellows participated in augmented teacher training and professional development activities, supporting their preparation for these careers (Cohen, 2015).

Based on its model of promoting the recruitment and retention of academically talented students into teaching careers in public schools throughout the state, the original NCTFP gained national attention as a model teacher recruitment program (e.g., Carver-Thomas & Darling-Hammond, 2017a, 2017b; Clewell & Forcier, 2001; Hirsch, Koppich, & Knapp, 2001; Kelly & Northrop, 2015; Podolsky & Kini, 2016). A program evaluation suggested that the original NCTFP's primary accomplishments were its success in recruiting high-ability students into teacher preparation programs and its production of graduates who were more likely to enter teaching, and more likely to stay in teaching, compared to education majors in the state not involved in the NCTFP (Henry, Bastian, & Smith, 2012). The original program did not focus on subjects and schools that were experiencing the greatest need for teachers. Instead, Henry et al. (2012) found that most Fellows became teachers in relatively high-income and high-performing schools, thus failing to actively address the unequal distribution of teacher talent across the state.

The reintroduction of the NCTFP. In 2017, the North Carolina General Assembly reinstated a new version of the North Carolina Teaching Fellows Program for implementation in the 2018-2019 academic year. Like the original NCTFP, new program participants are admitted under a competitive application process, with selected Fellows receiving upfront funding in the form of forgivable loans (up to \$8,250 per year) and professional development activities in exchange for their commitment to repay loans via teaching service in North Carolina public schools after graduation. Unlike the former version, participants in the new NCTFP must prepare for and commit to teaching careers in either STEM subject areas or special education (North Carolina State Education Assistance Authority [NCSEAA], 2017; NCTFP, 2017). The new program was implemented on a smaller scale than the previous program—at least for now—and provides Fellows with higher funding, likely to account for the increased cost of college

since the original program's conclusion (Debruyn, 2017; North Carolina Office of the State Auditor [NCOSA], 2003).

The new program also differs from the old NCTFP in its eligibility criteria and length of service requirements based on school type. While the original NCTFP only admitted incoming first-year undergraduate students, the new NCTFP expanded its eligibility to include incoming first-year undergraduate students, currently-enrolled undergraduate students already at partner institutions, undergraduate students planning to transfer to partner institutions, and bachelor's degree holders seeking eligible postgraduate teaching licensure (NCTFP, 2017). Current students can only apply if they are *not already* pursuing degrees in education (NCTFP, 2017).

Additionally, the new NCTFP incentivizes Fellows to complete their teacher service at low-performing schools, as designated by the State Board of Education's Department of Public Instruction, after completing their degree. According to NCDPI, low-performing schools are those that received a performance grade of D or F on the state's School Report Card based on student performance and academic growth (NCTFP, 2017). As Fellows enter teaching positions post-graduation, they can pay back their forgivable loans in service more quickly by choosing a position in a low-performing school. Under the new NCTFP, each year of forgivable loan money received may be forgiven by one year of teacher service at a low-performing public school or two years of service at a public school not designated low-performing (NCTFP, 2017). Fellows who do not meet teacher service requirements must pay back money received in cash with 8% interest.

As of the time of this study, the NCTFP is funded to newly support 130 future teachers per year with additional funding for statewide program enrichment activities (S. Ulm, personal communication, January 29, 2019). In 2018-2019, 110 students were accepted into the program, although only 74 participated (UNC System, 2019). The relatively low enrollment in the

program's inaugural year is likely a product of the program's quick implementation that left only two months between the state's announcement of the program and the deadline for Fellows applications (UNC System, 2017), providing limited time for campuses to set up and staff their respective programs and to recruit qualified students. The scale of the current program is therefore far smaller than that of the older program, also partnering with just five institutions instead of the original 17 (Cohen, 2015; NCTFP, n.d.; Stancill, 2017c). The current NCTFP is still under development, with hints of its size and structure being only a starting point with potential future growth (Fofaria, 2019; Joint Legislative Education Oversight Committee [JLEOC], 2018).

Table 1.1

Original and New North Carolina Teaching Fellows Program Criteria

	Original NCTFP (1987-2011)	New NCTFP (Established 2018-2019)
Applicant criteria	Incoming first-year undergraduate students in North Carolina (must be accepted at partner institutions)	Incoming first-year undergraduate students (must be accepted at partner institutions), currently enrolled undergraduates seeking to transition into a teacher education program at a partner institution (may be already enrolled at a partner institution or planning to transfer), or bachelor's degree holders planning to pursue either licensure or a master's degree in education at a partner institution; currently enrolled undergraduates may not already be enrolled in a teacher preparation program
Targeted participant demographics	Students of color, men, students from rural areas	None specified
Targeted subject areas	None specified	STEM education (mathematics, science, earth science, physical science, biology, physics, chemistry, agriculture, or technology); special education
Partner institutions	17 NC institutions (12 public, 5 private)	5 NC institutions (3 public, 2 private)
Funding amount	Up to \$6,500/year	Up to \$8,250/year

Table 1.1 (continued)

Professional development	Annual summer experiences: a week-long tour of the state, an enrichment course, a weeklong orientation in a school district; and campus-specific activities and requirements	At least one program-wide event each year of involvement (see Table 2.5) and campus-specific activities and requirements
Teaching requirements	1 year of teaching at a North Carolina public school for every 1 year of funding received within 10 years of graduation	1 year of teaching in a qualifying STEM or special education position at a North Carolina low-performing public school for every 1 year of funding received OR 2 years of teaching in a qualifying STEM or special education position at a North Carolina public school not considered low-performing for every 1 year of funding received; qualifying service must be completed within 10 years of degree completion
Cash payback requirements	If teaching requirements are not completed, all funding must be paid back with 10% interest within 10 years of graduation	If teaching requirements are not completed, all funding must be paid back with 8% interest within 10 years of graduation

Research Problem: Loan Forgiveness Requirements

While the new version of the NCTFP program seeks to respond to state teacher needs, the narrowed focus and longer service terms could create challenges for Fellows in meeting program service requirements to receive full loan forgiveness. Ideally, all Fellows will enter eligible teaching positions after completing their degrees and pay their loans in service, thereby achieving the program's original vision of enhancing the size and quality of the teacher workforce within the state whilst alleviating Fellows' postsecondary financial burdens. However, data from the original program show that at least 30% of Fellows did not complete required post-graduate teacher service, instead paying at least some of their funding back in cash, plus interest (Cohen, 2015; NCOSA, 2003).

Loan forgiveness through teaching. Overall, very little attention has been paid to Fellows' loan forgiveness progress in reports and descriptions of the original program. Instead, researchers who study or discuss the program focus on the personal characteristics, entry,

retention, and performance of NCTFP participants as teachers, rather than their post-graduate repayment of forgivable loans (Carver-Thomas & Darling-Hammond, 2017a, 2017b; Cohen, 2015; Henry et al., 2012; Podolsky & Kini, 2016). While retention in itself inherently relates to whether Fellows stayed in teaching positions for at least four years, the loan forgiveness aspect of the program is typically overlooked, even in the program's evaluation (Henry et al., 2012).

Two reports show that at least 30% of Fellows in the original program paid back the loans through cash instead of through teacher service (Cohen, 2015; NCOSA, 2003). The more recent figures come from Cohen's (2015) report, based on data received directly from the Public School Forum (T. Cohen, personal communication, October 21, 2018). These figures show that, as of 2015, 7,157 Fellows in the original NCTFP had paid back the scholarship money via teacher service or were in the process of doing so. In contrast, 2,959 Fellows were paying back the loans in cash, thus not meeting teaching requirements for repayment through service. At the time of the report, 536 Fellows were still enrolled in college (Cohen, 2015). These proportions are consistent with data from a 2003 state audit report on the program which reported that 29% of Fellows paid back their financial obligations in cash instead of service (NCOSA, 2003). Anecdotal accounts from former Teaching Fellows provide some insight into why some former Fellows did not complete their teaching service, with one media story featuring the experiences and pathways of men of color who participated in the original NCTFP. Men featured in the story who did not receive full loan forgiveness via teacher service described a multitude of reasons for this, including unanticipated professional opportunities that did not count toward forgiveness, difficulty in finding eligible employment, and administrative challenges (Hinchcliffe, 2019a). Based on the changing ownership of the program between iterations, data on the service completion and loan forgiveness status of original participants are limited and updated information is unavailable (S. Ulm, personal communication, January 29, 2019).

By joining the new NCTFP, students are not only committing to preparing for and entering careers in teaching but are also committing to specific types of teaching roles in either secondary STEM education or special education in North Carolina public schools. Further, the type of school (low-performing or not low-performing) where a graduate selects a job has critical implications for the timeline on which their loans will be forgiven. Students who enter the program as incoming first-year undergraduates and who receive four years of funding will owe four years of teacher service in low-performing schools or up to eight years in schools not considered low-performing, if they pay their loans back in service. Considering that service requirements are more restrictive and may be twice as long for current NCTFP participants as they were in the original program, the commitment that students make by participating in the NCTFP is substantial. Students' ability to successfully complete all program terms should lend itself to careful consideration in future research on program outcomes.

Outcomes of a similar program: TEACH Grant. The NCTFP's program design is not completely unique. The NCTFP resembles other federal, state, and local-level loan forgiveness programs that are designed to incentivize student entry into specific careers, including the federal TEACH Grant program. The TEACH Grant program, like the NCTFP, provides grant funding (up to \$4,000 per year) to participating students while they are in college, money that must be paid back in either eligible teaching service in high-needs schools in high-needs subjects, or in cash (Federal Student Aid [FSA], n.d.-d). Like the NCTFP, grant funding turns to loans for participants who do not complete eligible teacher service. In the case of the TEACH Grant, grant money is converted to direct unsubsidized loans, and participants are expected to pay the amount received in full, plus interest, starting at the date of TEACH Grant disbursement.

Reports of TEACH Grant program outcomes are more dismal than those of the original NCTFP. At least 63% of TEACH Grant recipients have had grant money converted to loans

instead of successfully paying the funding back through teacher service (Barkowski et al., 2018). More recent reports suggest that this number may actually be higher than 63% due to administrative errors from the company in charge of the certification process (Carter, 2018; Turner & Arnold, 2018a). For 42% of TEACH Grant recipients, if the money received during college had been categorized as a loan (as it later became for most participants), Grant recipients' loan totals would exceed federal borrowing limits. Exceeding loan limits can have detrimental long-term effects for borrowers' ability to pay back funds (Chapman & Deardon, 2017), especially for program participants who expected to meet program requirements through service and who did not expect the money to be converted to a loan (Barkowski et al., 2018; Consumer Financial Protection Bureau [CFPB], 2017; Government Accountability Office [GAO], 2015).

While the NCTFP program differs from the TEACH Grant in a several critical ways, especially in its inclusion of supplementary programming in addition to financial support and its design targeted specifically to North Carolina's economy, its similarities to the federal TEACH Grant program offer a cautionary tale. Both programs provide upfront grant-like funding for college students contingent on students' employment in eligible positions after college. Both programs narrow eligibility to teaching positions where shortages are greatest, including STEM and special education (BEST NC, 2018; FSA, n.d.-d). Further, while both programs are designed to incentivize teacher recruitment and retention, data available for both programs suggest that a number of participants will *not* meet these expectations (Barkowski et al., 2018; Cohen, 2015; GAO, 2015; NCOSA, 2003).

Teacher demand. Among the reasons that program participants may not meet teaching service requirements associated with loan forgiveness programs are program graduates' decisions not to pursue teaching careers, despite their preparation, or working in a teaching position that does not qualify for forgiveness (Barkowski et al., 2018). Across graduates of

teacher preparation programs, a substantial proportion do not end up entering teaching at all (Struyven & Vanthournout, 2014). Overall, research on college student career development suggests that students' majors and career ideas undergo significant evolution throughout the course of their college careers, meaning that students' plans can, and often do, change throughout their time in college (Astorne-Figari & Speer, 2019; Brown, 2004; Chen, 2013; Lichtenstein et al., 2009; Sampson, Reardon, Peterson, & Lenz, 2004; Smith & Gayles, 2017).

Even among graduates who do enter teaching, many will leave the profession, especially at the start of their careers. National data show that at least 17% of new teachers will leave teaching within their first five years (Gray & Taie, 2015; Sutchter et al., 2016). In North Carolina, 12.3% of teachers leave the profession in their first three years (NCDPI, 2018). The reasons that teachers leave are varied and may be based on personal circumstances but may also include job dissatisfaction related to high workloads, restrictive school policies, limited administrative support, lack of opportunities for growth and development, low pay, and more (Borman & Dowling, 2008; Denning, 2008; Struyven & Vanthournout, 2014). Research consistently shows that turnover is highest at schools with limited resources, often low-performing schools and/or those that serve high-needs student populations (Feng, 2009; Guarino et al., 2006; Horng, 2009; Simon & Johnson, 2015; Staklis & Henke, 2013; Sutchter et al., 2016).

Secondary STEM education. Beyond school type, teacher shortages are especially evident in certain subjects, such as science, technology, engineering, and math (Cross, 2016; Marder et al., 2017; NCES, 2012; Podgursky & Springer, 2011; Sutchter et al., 2016). A unique challenge to teacher recruitment in STEM subjects is that education competes with other industries for graduates with these in-demand skills (Fayer et al., 2017; Ingersoll & May, 2012; Langdon et al., 2011). All states require secondary school teachers to either complete an academic major in their subject area or to at least pass a licensure test of content knowledge

(National Council on Teacher Quality [NCTQ], 2018). As a result, STEM secondary education majors are often just as knowledgeable, skilled, and credentialed in STEM subject areas as their peers who do not pursue education majors and careers. Yet, while STEM industry careers offer the highest starting salary for college graduates, education careers offer the lowest (Carnevale, Cheah, & Hanson, 2015), creating a substantial opportunity cost for students who opt to enter careers in STEM secondary education (LiVecchi, 2017; Walsh, 2014).

Due to the national attention to STEM education and this study's narrative case study design which necessitates a small and focused sample (Creswell, 2014), this study focuses specifically on participants in the North Carolina Teaching Fellows Program who are preparing for careers in STEM education. In the present study, *STEM education* includes students in teacher preparation programs specializing in mathematics, science, earth science, physical science, biology, physics, chemistry, technology, and/or agriculture (NCTFP, n.d.). Further, because NCTFP participants must enter teaching positions that focus exclusively on STEM subjects (or special education), the sample for this study is limited to those who are preparing for careers at the *secondary level*, including middle (grades 6-8) and/or high school (grades 9-12), as elementary school teachers usually often teach multiple subjects (NCTFP, n.d.; NCTQ, 2018).

Purpose of the Study

In order to actualize program benefits, students who participate in the North Carolina Teaching Fellows Program must commit to a teaching career prior to completing education coursework and applied teaching experiences. In many cases, student participants will join the NCTFP and commit to finishing qualifying majors and going on to teach STEM or special education at public schools within North Carolina for *at least* four years (if they enter a low-performing school; eight years if not) before even beginning college. Thus, the success of the NCTFP in both serving Fellows effectively and in meeting North Carolina's teacher workforce

needs is contingent on participants' abilities to (a) complete an eligible degree program in STEM education or special education, (b) obtain employment at a school and position that meets NCTFP stipulations, and (c) stay in these eligible positions throughout the duration of their service period requirements. The service duration depends on students' entry point into the program; students who receive only one year of funding (e.g., towards funding a one-year master's program) may only owe one or two years of service depending on the type of school they enter. Fellows who graduate and who choose not to teach, choose to teach in non-qualifying positions, and/or who are unable to secure qualifying employment may find themselves with unanticipated loan debt after graduation, loans with an 8% interest rate, a rate that exceeds federal subsidized and unsubsidized loans (FSA, n.d.-f). Students who leave eligible academic programs prior to their graduation will similarly see their NCTFP funding translate into loans with interest.

Despite serving as a critical component of NCTFP eligibility and success, the career development of participating students has not been studied relative to this program. Further, a review of related literature did not produce any existing research on the career development of students participating in loan forgiveness programs that incentivize entry into teaching careers, even among larger programs with similar models such as the TEACH Grant. As a result, given the centrality of career decision making to the success of the NCTFP, the purpose of the present study is to understand the career development of NCTFP program participants preparing for secondary STEM teaching positions and participants' decisions to enter the NCTFP in the context of their career ideas and future goals.

Research Questions

The following research questions guide the present study:

- RQ1. What are the storied experiences of participants in the new North Carolina Teaching Fellows Program pursuing careers in secondary STEM education?
- RQ2: What are the key experiences that shaped the development of participants' interests in careers in secondary STEM education?
- RQ3: What are the perceived benefits and costs of NCTFP participation and how does the program shape participants' college and career plans?
- a. How do the benefits of the NCTFP shape participants' decisions to attend a partner institution?
 - b. How do the benefits of the NCTFP shape participants' decisions to pursue academic programs in secondary STEM education?
 - c. How do the benefits of the NCTFP shape participants' career goals related to teaching in North Carolina, teaching at low-performing schools, and plans to stay in teaching long-term?

Overview of Theoretical Frameworks

To address the research questions above, two theoretical perspectives are employed: social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994, 2002) and concepts drawn from behavioral economics that demonstrate bounded rationality in choice behaviors, including limited information, simplifying strategies in decision making, framing effects, and time-inconsistent preferences (Camerer & Loewenstein, 2004; Castleman, Baum, Schwartz, 2015; DellaVigna, 2009; Jabbar, 2011; Kahneman, 2003; Mullainthan & Thaler, 2001; Robinson, 2016). While SCCT offers a developmental framework for understanding how participants came to develop a career interest in teaching and in STEM subjects, especially through learning experiences and developing self-efficacy, concepts from behavioral economics provide additional insight into the decision-making behaviors of participants when choosing to apply for

and enter the North Carolina Teaching Fellows program, including principles related to cost-benefit analyses and bounded rationality evident within these decision processes (Weimer, 2017). As the decision to participate in the NCTFP represents a post-graduate commitment to teaching STEM or special education subjects at public schools in North Carolina, NCTFP participation serves as a proxy for career choice in the present study.

Social cognitive career theory. Social cognitive career theory is a career model that acknowledges the role of experiences, social cognition, and environmental factors in the development of career ideas and behaviors (Lent et al., 1994, 2002). According to the model, engagement in experiences leads to beliefs about one's skills or abilities in certain tasks, or self-efficacy, including outcome expectations, or how an individual will perform in similar experiences in the future. Self-efficacy and outcome expectations contribute to the formation of career interests, with people drawn to tasks and domains they expect to perform well in. In SCCT, interests then lead to the development of career goals, behaviors, and attainments related to these experiences and activities. While SCCT centralizes the premise that people have an active role in shaping their own career development and outcomes, it also acknowledges that environmental factors can have important influences on the types of experiences an individual is exposed to, and their success in these roles (Lent et al., 1994, 2002). See Figure 2.1 for a visual representation of the theory.

While SCCT provides a useful lens into the formation of participants' interests in teaching, it fails to address the nuances of making decisions about careers and professional opportunities, particularly in accounting for choice between multiple options. Here, behavioral economics concepts supplement SCCT by contextualizing the academic and career-related decisions that participants envision and make through their participation in the NCTFP.

Behavioral economics. Traditional economics concepts are based on the premise of rational choice, or the idea that people make decisions by weighing costs and benefits to select the optimal option, one that offers the lowest cost and the highest return. This perspective tends to assume perfect information access, comprehension, and the stability of beliefs over time, all of which lead to an accurate and rational analysis of information and decisions that maximize benefits while minimizing costs (Becker, 1994; Robinson, 2016). However, researchers in behavioral economics find that these principles are not realistic and fall short in explaining human behavior and choice (Bernheim, 2016; Castleman et al., 2015; Kahneman, 2003; Tversky & Kahneman, 1986; Weimer, 2017). Instead, humans demonstrate bounded rationality, making decisions based on limited information, the way information is presented, personal biases, simplifying strategies, changing preferences over time, and other non-linear thought processes (Camerer & Loewenstein, 2004; Castleman et al., 2015; DellaVigna, 2009; Jabbar, 2011; Kahneman, 2003; Mullainthan & Thaler, 2001; Robinson, 2016).

In the present study, I draw from behavioral economics to understand cost-benefit analysis processes and evidence of bounded rationality in participants' decision making. In doing so, I focus primarily on limitations related to information access and processing, framing effects, and time-inconsistent preferences (Camerer & Loewenstein, 2004; DellaVigna, 2009; Kahneman, 2003). As optimal decisions cannot be made when critical information is missing or when information and options are not fully understood, the availability of information and a person's processing of it can lead to decisions based on a bounded rationality. This is an especially likely scenario for students navigating highly complex postsecondary systems (Castleman et al., 2015; Dynarski & Scott-Clayton, 2006). Given the overwhelming nature of decisions when information is complicated and dynamic, I also use the concept of cognitive overload and resulting simplification strategies students may employ to make decisions.

Given the complexity of postsecondary and career decisions, framing effects are also used to understand decision making in the present study. Research suggests that, even if options are factually accurate and equivalent, the way in each option is conveyed can ultimately influence choice (Bertrand, Karlan, Mullainathan, Shafir, & Zinman, 2005; Camerer & Loewenstein, 2004; Levin, Schneider, & Gaeth, 1998; Mulhern, 2019; Tversky & Kahneman, 1981). Information and processes that reduce upfront costs while providing more easily accessible benefits are generally more attractive to consumers, even if benefits are the same across conditions (Beggs, Banthan, & Taylor, 2008; Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Castleman et al., 2015; Dynarski & Scott-Clayton, 2006; Field, 2009; Gandhi, 2008). This idea is also related to the final theoretical construct used to frame the current study: time-inconsistent preferences. While traditional economics theory assumes temporal consistency in preferences, behavioral economics suggest that preferences change over time and that people demonstrate a bias towards the present (Baum & Schwartz, 2015; Camerer, 2014; DellaVinga, 2009). Often, present-focused tasks are perceived more cumbersome than those in the future, leading to discrepancies between long-term goals that people set and short-term actions in meeting goals (Castleman et al., 2015). Although people tend to make decisions based on what they believe will make them happiest, it is difficult for people to predict the preferences of their future selves (Fudenberg, 2006). Further, people have a tendency towards overconfidence, commonly overestimating their ability to carry out particular tasks (Chambers & Windschitl, 2004).

Overview of Methodology

To answer the above research questions, this narrative case study provides an in-depth exploration of the career development and decisions of 10 student participants in the North Carolina Teaching Fellows Program preparing for secondary teaching positions in STEM

subjects across five partner campuses. Narrative inquiry is the inductive and interactive process of understanding and interpreting participants' storied experiences, examined over their life course (Clandinin & Connelly, 2000; Clandinin, 2013; Connelly & Clandinin, 1990; Creswell, 2014; Elder, Johnson, & Crosnoe, 2003; Riessman, 2008). Case study methods are additionally used to guide the use of multiple data sources and to bound the study based on the context of the NCTFP program (Yin, 2014). Participating students conducted two interviews, two surveys, a timelining activity and shared supplementary documents, all related to their development of career interests in STEM education and their decision to participate in the NCTFP.

Data analysis was conducted in two stages using thematic narrative analysis and category-centered analysis (Riessman, 2008). First, I organized each narrative via a "restorying" process to convey and analyze each story on its own (Clandinin & Connelly, 2000; Clandinin, 2013; Connelly & Clandinin, 1990; Creswell, 2014; Riessman, 2008). Through the narratives, I used subheadings to organize and visually depict themes using participants' own words (Saldaña, 2015). Next, I conducted a category-centered analytic approach based on the theoretical perspectives outlined above. As part of this process, I again used in vivo codes to honor participant language in themes (Saldaña, 2015). Throughout the study, member-checking was critical to data and analytic integrity. Participants were invited to review their transcripts and submitted materials and second interviews allowed participants time and space to provide feedback on initial narrative drafts and emerging findings. Further, I conducted interviews with program coordinators at all five participating institutions and with the statewide program coordinator to confirm program details and to provide a rich, thick description of the NCTFP across settings. Overall, the study design aimed to provide an in-depth analysis of participants' career development and decisions related to the NCTFP. The study concludes with implications

for the successful recruitment of prospective STEM teachers into needed positions within North Carolina via the North Carolina Teaching Fellows Program.

CHAPTER 2: LITERATURE REVIEW

The following literature review situates the present study within existing research and current events, starting with an overview of the teacher workforce and STEM education in the U.S. and in North Carolina. First, I discuss teacher shortages, including challenges recruiting and retaining teachers in STEM subjects. Next, I concentrate on issues related to teacher compensation, detailing federal and state economic incentives designed to recruit teachers into the profession. As a state-level economic incentive, I then focus more narrowly on the development and evolution of the North Carolina Teaching Fellows Program, providing an overview of both the original program and the new iteration, implemented in 2018-2019. Research on college student career development and decision-making is presented next, followed by the theoretical frameworks that guide the present analysis.

Teacher Shortages

Across the U.S., about 3.6 million people make up the K-12 teacher workforce (Vilorio, 2016). Approximately 10% of college graduates enter K-12 teaching jobs within one year of earning their bachelor's degree (Staklis & Henke, 2013). An additional 7% of graduates have completed teaching coursework, student teaching, or teacher certification (Staklis & Henke, 2013). However, despite the large teacher workforce, teacher shortages have plagued K-12 systems across the country for several decades, with trends exacerbated in recent years, especially in STEM subjects (Cross, 2016; Marder et al., 2017; Sutchter et al., 2016).

Throughout the 1900s, K-12 systems across the U.S. saw significant growth in the numbers of both students and teachers. The largest teacher growths could be seen in the 1940s following World War II, and again in the 1980s (Ingersoll, Merrill, & Stuckey, 2014). Although student enrollment peaked in the 1970s, the teacher workforce continued to grow in the years following. From 1987 to 2012, student enrollment increased 19%, with teacher growth

increasing over twice as much, at 46%, allowing for a reduction in student-teacher ratios (Ingersoll et al., 2014). After this time, however, teacher hiring slowed. The 2008 Great Recession brought hiring freezes, layoffs, retirement, and saw voluntary teacher attrition even as student enrollment continued to grow (Ingersoll et al., 2014; Sutchter et al., 2016). In recent years the education workforce has been in recovery, with schools beginning to hire teachers to make up for shortages that occurred during the Recession (Sutchter et al., 2016).

The term “teacher shortage” is used in reference to an inadequate supply of teachers based on demand (Cross, 2016). Teacher shortages are typically a result of variables such as student enrollment, teacher turnover and retirement, and student-teacher ratios (Sutchter et al., 2016). Some researchers attribute current demand to schools reinstating classes and programs that were cut in 2008, as well as a continued focus on reducing student-teacher ratios (Ingersoll et al., 2014). Within math and science, greater political attention to STEM education has led to increased student coursetaking and additional graduation requirements in these subjects, also inspiring a growing need for qualified teachers in STEM subject areas (Ingersoll & Perda, 2010; Marder et al., 2017).

In recognition of these trends, Sutchter et al. (2016) write of a “coming crisis” in the ability of schools to hire qualified teachers, especially in STEM fields and special education. Nationally, college student enrollment in teacher preparation programs is down 35% in the past five years, a decrease of nearly 240,000 prospective teachers (NCES, 2017; Sutchter et al., 2016). In 2014-2015, the number of students enrolled in teacher preparation programs was just one-quarter of the number enrolled in 2001-2002, a historic low (Carver-Thomas & Darling-Hammond, 2017b). Simultaneously, teacher attrition has risen over time (Sutchter et al., 2016). Carver-Thomas and Darling-Hammond (2017b) estimate that approximately 90% of the national demand for teachers is created by teacher retirement and attrition, as two-thirds leave the field

before retirement age. From year to year, it is estimated that about 8% of public school teachers leave the profession nationally, with another 8% changing schools (Keigher, 2010). Attrition rates are greater among teachers in their first three years, with 9% leaving the profession each year (Keigher, 2010), and with approximately 17% leaving the profession within their first five years (Gray & Taie, 2015; Sutchter et al., 2016). North Carolina sees similarly high attrition among new teachers; 12% of teachers leave the profession in their first three years (NCDPI, 2018, 2019). Looking nationally, Ingersoll and Perda (2010) suggest that teachers leaving the profession before retirement age is the biggest contributing factor for teacher shortages in science and math subjects. Figures from the first 10 months of 2018 suggested that teacher attrition rates were at the profession's highest since 2001 (Hackman & Morath, 2018).

In response to shortages, several states report an uptick in hiring teachers with substandard and emergency credentials to fill needed roles in place of teachers with state certification and licensure, as is usually required (Levin, Berg-Jacobson, Atchison, Lee, & Vontsolos, 2015; Darling-Hammond, Furger, Shields, & Sutchter, 2016). In California, the number of emergency-style permits, waivers, and credentials disbursed to allow unqualified teachers to fill needed roles in 2015-2016 was five times that of just three years prior (Carver-Thomas & Darling-Hammond, 2017a). Twenty percent of math and science teachers in the state entered their roles with substandard credentials in 2012, a number that increased to 40% in 2016 (Carver-Thomas & Darling-Hammond, 2017a). This trend has important implications for K-12 students, as teachers without certification tend to be less effective than certified teachers (Clotfelter, Ladd, Vigdor, 2010; Ladd, 2008).

Half of teachers in North Carolina are prepared via bachelor's programs at colleges and universities within the state, with 37.5% of teachers are prepared through the state's public UNC institutions and another 12.6% prepared by private institutions (Bastian & Xing, 2016). Over a

quarter of the state's teachers are prepared in other states (28.7%), with 16.5% entering the career through alternative entry programs, including .6% through Teach for America (Bastian & Xing, 2016). While alternative entry programs may help to fill needed roles, researchers have called the sustainability and effectiveness of these programs into question. Evidence suggests that teachers who enter the career through alternative pathways tend to be less likely to stay in the career and less effective than certified teachers who enter the career from teacher preparation programs (Donaldson & Johnson, 2011; Laczko-Kerr & Berliner, 2002; Zhang & Zeller, 2016). Data from North Carolina show mixed findings on teacher effectiveness based on preparation type, grade level taught, and school type (Bastian & Xing, 2016). However, data do reveal differences in retention rates. Graduates prepared at public and private North Carolina institutions are more likely to stay in the state's public schools for their third and fifth years of teaching than teachers who were prepared out of state, or those who entered the career through alternative pathways (Bastian & Xing, 2016).

Despite these dynamics, some question the severity of national teacher shortages (Barshay, 2016). From the 1980s to 2008, the number of teachers with degrees in math or math education increased 74% and the number of science or science education teachers increased 86% (Ingersoll et al., 2014), although these figures precede the Great Recession. Ingersoll and Perda (2010) argue that growths in science and math teachers met demand and outpaced those of other subject areas, although the relative number of STEM teachers still lags behind many other subject areas. Further, while teacher attrition is evident in all subject areas, some researchers have found higher attrition among science and math teachers (Borman & Dowling, 2008; Guarino, Santibañez, & Daley, 2006). Although others have not found this trend (Ingersoll & May, 2012), teacher attrition in STEM subjects may be problematic regardless given the

relatively limited supply of qualified replacements when turnover does occur (Ingersoll & Perda, 2010).

While researchers may disagree on the scale and severity of teacher shortages in STEM fields across all schools and areas, they do agree on the presence of teacher shortages for certain geographic areas and schools (Ingersoll & Perda, 2010; Sutchter et al., 2016). The availability of qualified teachers is skewed significantly by school poverty level, with higher-poverty schools experiencing the greatest difficulty recruiting and retaining qualified teachers, both nationally (Borman & Dowling, 2008; Feng, 2009; Feng & Sass, 2018; Gilpin & Kaganovich, 2012; Guarino et al., 2006; Simon & Johnson, 2015; Struyven & Vanthournout, 2014; Sutchter et al., 2016) and in North Carolina (BEST NC, 2018; Clotfelter et al., 2011). As a result, these schools have higher rates of teachers without certifications or advanced degrees in their subjects (Marder et al., 2017; NSB, 2016), creating a cycle of inequities regarding educational quality and student achievement and outcomes.

STEM Teacher Preparation and Workforce

While school policies about teacher qualifications and eligibility vary widely, all states require teachers to obtain licensure, if not also a bachelor's or graduate degree in their content area (Education Commission of the States, 2017; NCTQ, 2018). While 25 states require high school teachers to hold a bachelor's degree in their content area, approximately 20 also states require middle school teachers to have a content-specific degree, and 13 states require the same of elementary school teachers (U.S. Department of Education [DOE], 2013). Teachers with bachelor's degrees in science and math comprise about 12% of all K-12 teachers and work predominantly in middle school and high school positions (85%; Ingersoll & May, 2012).

Nationally, approximately 15% of all public school teachers are teachers in STEM subjects, with 82% of these teachers located in middle or high schools, as the majority of

elementary school teachers teach math and science in addition to other subjects (NSB, 2016). Yet, science and math teaching positions are among the most difficult for schools to fill with qualified candidates (Marder et al., 2017; NCES, 2012; Podgursky & Springer, 2011; Seastrom, Gruber, Henke, McGrath, & Cohen, 2004). In 2012, over half of secondary schools across the U.S. had openings for math teachers, with most of these schools reporting difficulty filling these positions (NCES, 2012). While three-quarters of principals reported that it was easy to fill elementary teacher positions, only one-third said the same for science and math positions (Podgursky & Springer, 2011). Numbers are similar in North Carolina: 78% and 64% of public schools report difficulty filling high school math and science teacher positions, respectively (BEST NC, 2018). At the middle school level, 59% of schools had difficulty filling math teacher positions and 50% had difficulty filling science teacher roles (BEST NC, 2018).

Based on staffing challenges, K-12 teachers in STEM subject areas are especially likely to enter the profession through alternative and emergency credentialing systems instead of via obtaining a bachelor's degrees in education or in their content areas compared to teachers in other subjects (Marder et al., 2017; NSB, 2016; Seastrom et al., 2004). Data from the 2012 Schools and Staffing Survey show that significant portions of science and math teachers did not major or minor in the subjects they now teach during their bachelor's programs, with the physical sciences (especially earth science, chemistry, and physics) experiencing the greatest challenges hiring teachers prepared for these subject areas (Marder et al., 2017). While math tends to have relatively low shortage rates compared to other STEM subjects nationally (Marder et al., 2017), North Carolina data show greater staffing challenges in math compared to science, although these data do not disaggregate science subjects in order to compare life sciences, physical sciences, and more (BEST NC, 2018; NCDPI, 2018). Notably, while high school courses in engineering and computer science are still relatively rare, K-12 participation in these

subjects is growing (College Board, 2018; Dickey, 2016; Guzdial, 2012; Marder et al., 2017), which may continue to increase demand for teachers trained in these subject areas as well.

Overall, 64% of college graduates who enter teaching have taken college-level math, although they are less likely than graduates who enter other fields to have taken calculus and other advanced math courses (25% versus 37%, respectively; Staklis & Henke, 2013). Similarly, while 89% of teachers have taken college-level science, they are less likely than other graduates to have earned credits in advanced laboratory science (33% vs. 39%; Staklis & Henke, 2013). Among teachers, research suggests relatively limited STEM training in comparison to training in other subjects. Although elementary teachers may teach a variety of subjects and do not typically instruct high-level mathematics, research suggests that they, too, lack sufficient STEM training. The National Council on Teacher Quality (2018) finds that just 13% of undergraduate programs in elementary education cover number and operations topics such as algebra, geometry and data and probability, and just 1% of elementary education graduate programs do the same. As a whole, the subject matter training of STEM teachers leaves room for improvement in meeting national needs.

In addition to subject matter knowledge, teacher experience and pedagogical preparation is also critical to student educational outcomes. In a comprehensive study of North Carolina teachers, Clotfelter et al. (2010) found that years of experience are significantly related to gains in student achievement during a teacher's first five years, with the effect wearing off after that point. Among new teachers, classroom experience is also important. Harris and Sass (2007) found that education courses taken by high school math teachers increases their classroom effectiveness. Similarly, Boyd, Grossman, Lankford, Loeb, and Wyckoff (2009) found that teaching preparation does matter: teachers who have greater math skills are no more effective than their peers in teaching until their second year, once teaching skills have been refined. Thus,

while technical skills in STEM fields are important to teacher effectiveness, training in pedagogical skills and other teaching practice are also crucial for new teachers.

Academic achievement. Difficulties filling STEM teacher roles with qualified graduates lead to concerns about the quality of teachers in STEM, especially as teachers with strong technical skills in these fields may be especially qualified for better-paying careers outside of education. Given the opportunity costs of entering teaching positions, especially in subjects with high market value in the private sector (LiVecchi, 2017), teaching professions often struggle to recruit the highest-performing college students (Goldhaber, Gross, & Player, 2007; Walsh, 2014). When academic credentials such as college selectiveness, major, and SAT scores are controlled, graduates who enter teaching make less money than equally talented graduates who select other fields (Goldhaber et al., 2007). Thus, perhaps it is unsurprising that education fields have long struggled to attract top-performing students (Ingersoll et al., 2014; Walsh, 2014) and students from highly selective colleges (Goldhaber et al., 2007; Kelly & Northrup, 2015).

Understanding the effects of teacher achievement on student learning can be difficult to measure, but several studies have found that teacher credentials are positively associated with student achievement (Clotfelter et al., 2010; Goldhaber et al., 2007; Ladd, 2008). Metrics such as a teacher's standardized test scores, grades, advanced degrees, certification, and the selectivity of their undergraduate institution have been used by researchers to indicate teacher aptitude and effectiveness, although some researchers argue that such credentials provide only minimal insight into teacher ability and on-the-job performance (Goldhaber et al., 2007; Rothstein, 2015). In this work, selection bias must be accounted for, as teachers with higher credentials are more likely to work in schools with greater resources that can incentivize their entry. As well-resourced schools also tend to enroll higher-income students, there is often a natural correlation between teacher credentials and student achievement.

Gender and race. To address teacher shortages, researchers and policymakers have suggested increasing the participation of underrepresented groups such as men and people of color in the teaching profession (Diekman & Benson-Greenwald, 2018). As of 2012, 76% of all teachers were women (Ingersoll et al., 2014). In North Carolina, women comprise 80% of all public school teachers (BEST NC, 2018). While there are proportionally more male teachers in STEM subjects than in all other teaching areas, women still comprise the majority of secondary STEM teachers across the U.S. (DOE, 2016), even in spite of their underrepresentation within most STEM academic majors in colleges and universities and other STEM careers (National Science Foundation [NSF], 2017). As of 2012, women comprised 65% of math and computer science teachers and 62% of natural science teachers (DOE, 2016).

Beyond gender representation, racially minoritized teachers represented only about 17% of the teaching workforce as of 2012 (Ingersoll et al., 2014). The teacher workforce has been predominantly White throughout the course of U.S. history, although the numbers of racially minoritized teachers have grown significantly in recent years (Guarino et al, 2006; Ingersoll & Merrill, 2017; Ingersoll et al., 2014). In North Carolina, 73% of current teachers are White, 24% are Black, and just 3% are other races (BEST NC, 2018). By comparison, over half of students are part of racially minoritized groups (NCDPI, 2015).

Research suggests that gender and racial disparities between teachers and students are problematic to equitable educational opportunity and success for underrepresented student groups. In short, representation matters. A study of Black male high school students in a teacher preparation program found that participants reported feeling more connected to teachers who shared their demographic identities (Bianco, Leech, & Mitchell, 2011). Conversely, having teachers that did not look like them spurred disinterest in the profession, especially because of the prevalence of racial bias and racism in the school (Bianco et al., 2011). In general, research

suggests that Black and Hispanic college students are less likely to major in education, are less likely to be hired for teaching positions, and are less likely to be retained in teaching careers in comparison to their White counterparts (Putman, Hansen, Walsh, & Quintero, 2016).

Broadly, the lack of racially minoritized teachers has been cited as an important reason for the achievement gap and unequal outcomes for students of color (Egalite, Kisida, & Winters, 2015; Gershenson, Hart, Lindsay, & Papageorge, 2017; Ingersoll et al., 2014; Putman et al., 2016; Redding, 2019). Teachers of color are more likely than White teachers to be employed in public schools and to work in low-income, high-minority and urban schools where shortages of qualified teachers are most severe (Ingersoll et al., 2014). Secondly, there is evidence of unconscious race bias towards students of color among teachers (van den Bergh, Denessen, Hornstra, Voeten, & Holland, 2010), further underscoring the importance of racial representation among teachers in student success (Egalite et al., 2015; Jacob, 2012; Redding, 2019). Finally, students who have teachers that share their gender and racial characteristics may view the teaching profession more positively (Bianco et al., 2011). Together, these studies suggest that racially minoritized teachers may not only be more inclined to serve students in schools where quality teachers are most needed, but their representation may also help foster greater student success, potentially also helping to generate career interests in teaching among a racially diverse student population.

Teacher Compensation

The STEM pipeline has received great attention from policymakers and researchers alike, especially as job opportunities in these fields continue to grow, outpacing the production of STEM graduates in fields such as engineering and technology (Fayer et al., 2017; Langdon et al., 2011). As such, the competitive labor market for students with STEM skills has been identified as another reason behind the shortage of science and math teachers (Ingersoll & May, 2012;

Marder et al., 2017; While subject matter aptitude is important for teaching effectiveness, college graduates highly skilled in STEM fields may incur significant compensation loss by entering teaching instead of the private sector, both in starting salary and in wages over the course of their careers (Carnevale et al., 2015; Goldhaber et al., 2007; LiVecchi, 2017; Walsh, 2014). Looking across STEM and STEM education majors, one study estimates that graduates who enter teaching instead of industry incur a \$300,000-\$500,000 loss in earnings the course of a 35-year career as a result of lower teacher pay (LiVecchi, 2017).

Among college graduates, education majors and workers tend to have some of the lowest earning potential, both immediately after college and later into their career (Carnevale et al., 2015; Kirkeboen, Leuven, & Mogstad, 2016). The median starting salary for graduating college students who enter teaching (\$33,100) is lower than those of graduates in other fields (\$34,100; Staklis & Henke, 2013). Over time, education majors continue to earn relatively less than college graduates of other subjects, with education majors ages 25-60 earning the lowest median salary of all college graduates, at \$45,000 (Carnevale et al., 2015). Notably, there is difference between teacher level and type—as well as by location and school. Early childhood educators earn the lowest median salary of all college majors, approximately \$39,000, while secondary teachers earn more by comparison, a median of \$48,000 (Carnevale et al, 2015). Among science and math teachers, median salaries resembled overall figures, with \$48,000 for science teachers and \$49,000 for math teachers (Carnevale et al, 2015). Further exacerbating relatively lower starting salaries, education majors experience more limited wage growth over time, 32% over the course of their careers, whereas STEM majors in other industries see an average wage growth of 50% (Carnevale et al., 2015).

Within this context, the opportunity costs for STEM majors to enter teaching are a significant barrier to recruitment, especially among those who may be sensitive to financial

factors. Teaching is one of few fields where salary rates and structures are set by states and school systems instead of by market conditions (Miles, Pennington, & Bloom, 2015; Podgursky & Springer, 2011). Although this structure promotes transparency and rewards seniority, it is inherently different from non-teaching labor markets where pay is based on demand. Structured salary rates among teachers suppress financial return based on merit and skill, dynamics that appear to be an important deterrent for students in STEM majors (Walsh, 2014). While a recent national survey found that approximately half of students in STEM college majors and minors report at least mild interest in teaching, students in these subjects identified salary as one of the biggest deterrents for the career (Marder et al., 2017). At the same time, STEM student respondents underestimated teacher salaries, with actual teacher salaries exceeding the figures that students said they would consider in order to enter teaching. This finding is consistent with other research that shows relatively limited knowledge of salary rates among college students (Arcidiacono, Hotz, & Kang, 2012; Ruder & Van Noy, 2017; Wiswall & Zafar, 2015).

Other financial factors may serve as additional deterrents for students in STEM majors to consider and enter teaching careers. College costs, for instance, have risen significantly in recent decades, with greater proportions of students taking out loans to pay for college and borrowing more money than in the past (Akers & Chingos, 2016; Baum, 2016; Cellini & Darolia, 2016; Chan et al., 2019; Woo, 2013). Beyond earning a bachelor's degree, 56% and 61% of K-12 math and science teachers hold advanced degrees, respectively (NSB, 2016). As a result, teachers may encounter significant postsecondary education costs from their undergraduate and graduate degree programs, with implications for prioritizing higher wages in order to pay back student loans and manage other financial responsibilities.

Some researchers have found that higher college costs and larger student debt burdens deter students from choosing majors and careers in lower-paying jobs and fields, including

teaching (Baker, 2016; Minicozzi, 2005; Rothstein & Rouse, 2011; Rumbaugh, 2016; St. John & Chung, 2004). An older report examined graduates' debt burdens, loan interest rates, and starting salaries, finding that 23% of graduates from public institutions and 38% of graduates from private institutions would have unmanageable debt burdens if they entered teaching careers based on the size of expected loan payments (Swarthout, 2006). Notably, college costs have grown substantially since this study (McFarland et al., 2018), suggesting the likely possibility of even greater financial deterrents and constraints among college graduates who may be interested in pursuing teaching careers today. While repayment options such as income-based repayment programs and teacher support programs are now more prevalent, awareness and participation in these programs remains relatively low (Anderson, Conzelmann, & Lacy, 2018; Boatman, Evans, & Soliz, 2014; FSA, 2018; GAO, 2015). Overall, teachers are more likely to have borrowed money to fund their college education in comparison to graduates in other fields (Staklis & Henke, 2013), and earning lower salaries may restrict teachers' ability to repay student loans (Chapman & Deardon, 2017).

Relatively low teacher salaries and growing college costs are reason for concern in recruiting teachers today. Lower salaries serve as a deterrent for high-achieving college graduates to enter these fields, with implications for teacher quality (Gilpin & Kaganovich, 2012; Guarino et al., 2006). By contrast, higher teacher salaries are been positively associated with both recruiting and retention (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009; Feng & Sass, 2018; Imazeki, 2005), including the recruitment of more academically talented students into teaching (Leigh, 2012), and with greater job satisfaction among teachers (Guarino et al., 2006; Kelly & Northrup, 2015). The higher the pay, the more compelling of an incentive salary is in attracting and retaining teachers, although the influence is often mitigated by individual and school characteristics (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009; Feng &

Sass, 2018; Imazeki, 2005). Overall, the lowest performing schools tend to have the most difficulty recruiting and retaining teachers. While offering higher pay may help, low-performing schools typically have limited resources and increases would need to be substantial in order to be effective (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009, Feng & Sass, 2018).

Teacher compensation in North Carolina. In North Carolina, salary figures are lower than the national average, generally also below the average within the U.S. southeast region (National Education Association [NEA], 2018). In 2017-2018, North Carolina ranked 39th in average teacher pay, at \$49,970, compared to a national average of \$59,660 (NEA, 2018). Recent estimates from the NEA suggest that ranking has improved over the last year, with the state expected to move to 29th in the country for average teacher pay based on the 2018-2019 academic year (Hui, 2019b). As a whole, conversations about teacher pay are a hot topic within the state. As teacher strikes broke out across the country in Spring 2018 (Turner & Lombardo, 2018), teachers in North Carolina followed suit and led a one-day march and rally in North Carolina's state capital on May 16, 2018. Forty-two schools across the state closed for the day as an estimated crowd of 20,000 protested the capital to demand greater support for K-12 public education, including teacher pay (Webster, 2018). A second march occurred on May 1, 2019, with 34 school districts and 10 charter schools closing for the event (Hui, Quillin, Vaughn, Johnson, & Polk, 2019).

Like many states, North Carolina establishes base teacher salary rates based selected credentials (namely, whether a teacher has National Board Certification), and years of experience (NCDPI, 2017). However, teacher salaries across the state vary widely based on system-specific supplements, or annual amounts that some school systems provide in addition to the state's base pay. Across the state, the average supplement is currently 8.4% of base pay (BEST NC, 2018), an average of \$4,194 (NCACC, 2017). Salary supplements across North Carolina public schools

range from a high of \$8,435 in the Wake County School System, the second-largest district in the state to \$0, no salary supplement at all, in six county school systems (Bertie, Clay, Graham, Halifax, Swain, and Weldon)—all small and rural systems that employ about 200 or fewer teachers (NCACC, 2017). Size does not necessarily preclude supplements; some small districts with fewer than 200 teachers still provide salary supplements (NCACC, 2017). As a result, there is a wide discrepancy between the abilities of schools to recruit top teacher talent across the state. Wake County and Charlotte-Mecklenburg public school systems offer the highest salary supplements and are located in the state's two most populous areas, Raleigh and Charlotte, two cities that hold the highest concentrations of adults with postsecondary degrees and that are seeing significant economic growth (Tippett & Stanford, 2019). In contrast, smaller and more rural districts offer lower salaries and may be less economically and socially attractive destinations, especially among new college graduates.

Economic Incentives to Recruit Teachers

In response to teacher shortages and need, teacher economic incentive policies are in place at multiple levels of the U.S. education system. Such policies aim to incentivize teacher recruitment and retention, with different policies prioritizing different aspects of teacher workforce dynamics and shortage concerns (American Federation of Teachers [AFT], n.d.; Clewell & Forcier, 2001; Kolbe & Strunk, 2012). Teacher recruiting policies are often designed to increase the size, diversity, and overall quality of the teaching workforce to meet national, state, and local needs. While teacher recruitment-focused policy strategies may include enhanced marketing, additional teacher training and professional development, or curriculum redesign, many of the strategies aimed at enhancing teacher recruitment and retention take the form of economic incentives (Clewell & Forcier, 2001; Kolbe & Strunk, 2012). Economic incentives may include salary enhancements, short-term benefits (including relocation support, signing

bonuses, and performance-based awards), loan forgiveness, tuition subsidies, tax credits, and in-kind incentives aimed to motivate teachers to enter teaching positions where shortages are greatest (AFT, n.d.; Clewell & Forcier, 2001; Kolbe & Strunk, 2012).

Overall, economic incentives have been found to be moderately successful in increasing teacher recruitment and retention, with the success of each policy contingent on larger context, including geographic area, school, and teacher characteristics, and the nature and size of the incentive. Higher teacher salaries and bonuses are positively associated with recruiting more postsecondary students into teaching fields, including recruiting more talented students (Gilpin, 2012; Leigh, 2012), with recruiting teachers to certain schools (Cowan & Goldhaber, 2018), and to increasing teacher retention (Fulbeck, 2014; Hendricks, 2014, 2015). Between the two, higher pay produces more positive effects than bonuses (Clotfelter et al., 2011; Guarino et al., 2006; Feng, 2009; Feng & Sass, 2018; Hendricks, 2014, 2015; Imazeki, 2005; Rickman et al., 2017). Despite an overall predictive relationship, researchers find variation in the effects of these incentives based on school-level and individual-level variables, including the racial, income, performance, and behavioral characteristics of a school's student body, as well as individual teacher credentials and characteristics (Clotfelter et al., 2011; Feng, 2009; Rickman et al., 2017). The more difficult the working conditions in a school and the more qualified the teacher, the higher the incentives need to be to serve as effective incentives (Clotfelter et al., 2011).

Loan forgiveness programs. One economic incentive strategy designed to recruit teachers to into the profession focuses on reducing the overall burden of college expenses through loan forgiveness programs. Loan forgiveness programs are one example of limited-duration economic incentive programs that are particularly popular at the state level (Kolbe & Strunk, 2012). Loan forgiveness programs forgive all or part of a teacher's student loans if the teacher enters and stays in an eligible position, with programs often targeting geographic or

subject shortage areas (Kolbe & Strunk, 2012). Teachers may become eligible for some loan forgiveness programs only after they graduate, with the program alleviating loan debt already accrued based on eligible service, as is the case for the federal Teacher Loan Forgiveness Program (TLFP; FSA, n.d.-g). In contrast, other loan forgiveness programs, like the TEACH Grant and the NCTFP, recruit students while they are still in college, offering loan money upfront with expectations for post-graduate repayment, either via eligible teacher service or in cash with interest.

Evidence suggests that loan forgiveness and other incentives related to alleviating college costs may serve as useful recruiting tools for students considering teaching (Marder et al., 2017), or at least effective in directing students towards certain types of teaching positions (Kramer & Peyton, 2017; Liou & Lawrenz, 2010). One study found that while the TEACH Grant program wasn't effective in recruiting students to pursue education majors, the program increased the number of teacher education graduates entering positions in high-needs subjects and at low-performing schools, the types of positions required by program participation (Kramer & Peyton, 2017). Similar results were found in association with the Robert Noyce Teacher Scholarship Program, a National Science Foundation initiative that offers students scholarship money with post-graduate teaching requirements in STEM subjects in high-needs schools (American Association for the Advancement of Science, 2018). Results from a study on the Robert Noyce Teacher Scholarship Program showed that while the program was not effective in drawing students to education, it did increase the number of graduates entering teaching roles in high-needs schools (Liou & Lawrenz, 2010). Similar to findings related to other incentive programs, Liou and Lawrenz (2010) concluded that the higher the percentage of tuition covered by grant funding, the more influence it had on students' decisions to become teachers or to teach in high-need schools.

Federal loan forgiveness programs for teachers. At the federal level, three primary loan forgiveness programs are designed specifically for teachers, the Teacher's Loan Forgiveness Program (TLFP), Perkins Loan Cancellation for Teachers (PLCT), and the program that most resembles the NCTFP, the TEACH Grant. Additionally, while not specific to teachers, most teachers are eligible for the Public Service Loan Forgiveness Program (PSLF). Although these four programs have similar goals, their differing eligibility requirements, structures, and award amounts comprise a complex array of federal policy options for teachers seeking loan forgiveness. For instance, while teachers at any type of school may qualify for the PSLF, future and current teachers seeking to participate in the TLFP, the PLCT, or the TEACH Grant programs must teach in high-need schools and subject areas. Additionally, while the TLFP, PLCT, and the PSLF all provide loan relief for teacher after their graduation and entry into qualifying roles, the TEACH Grant provides upfront forgivable loans to college students in return for expected future service.

To date, research on federal loan forgiveness programs is exceptionally limited. The TEACH Grant has been the focus of three government publications (Barkowski et al., 2018; CFPB, 2017; GAO, 2015), and one academic study (Kramer & Peyton, 2017). I was unable to locate any scholarly, government, or peer-reviewed articles or reports on any of the other federal-level teacher incentive programs described here. Two reasons for the current lack of research on these topics are the limited availability of data and the policies' respective complex and longitudinal designs. Successful completion of any of the federal programs mentioned above is contingent on graduates meeting all program requirements, a process that can extend for up to 10 years beyond degree completion. As these programs were largely enacted between 2000 and 2010, early cohorts of participating graduates are just starting to become eligible for full benefits, leading to the limited existence of outcome data at this time.

Below, I detail each of these four policies, especially the TEACH Grant program, to provide insight into the structure of loan forgiveness programs available for teachers at the federal level. While the multitude of loan forgiveness programs for teachers may seem like a promising indicator of public support for teachers, the complexity of these options can lead to cognitive overload, perhaps stymieing teachers from weighing options rationally and/or from participating at all (Castleman et al., 2015). Limited available data suggest that awareness, understanding, and participation in these programs is relatively low overall. Even among those who do enroll in these federal programs, data on program completion, albeit limited, show that only a small minority of participants complete all requirements and receive benefits (CFPB, 2017; FSA, 2018; GAO, 2015). Thus, participation metrics alone serve as an incomplete indicator of policy completion and success (CFPB, 2017). Each of the four programs are described below, with a summary available in Appendix A.

Public Service Loan Forgiveness Program. Although the PSLF program is not specific to teachers, most teachers qualify for this program. Those eligible for PSLF work full-time for a qualifying employer at a government organization or a not-for-profit that is tax-exempt or that otherwise qualifies based on its services provided under Section 501(c)(3) under the Internal Revenue Code (FSA, n.d.-b). To be eligible, participants must have Direct Loans, although other types of federal loans could be consolidated into a Direct Consolidated Loan. As the policy currently stands, PSLF forgives remaining loan balance on Direct Loans after 120 qualifying monthly payments while the borrower works full-time for a qualifying employer. Teachers may receive loan forgiveness under both the PSLF program and the federal Teacher's Loan Forgiveness Program (TLFP), but the qualifying service terms for each program must not overlap (i.e., after receiving the TLFP after five years of eligible service, borrowers can then enroll in the PSLF program and begin their 120 eligible monthly payments).

First implemented in October 2007, the PSLF reached its 10-year anniversary in 2017, where the first cohort of participants became eligible for loan forgiveness. Early figures on program completion have been bleak. As of September 30, 2018, 41,221 unique borrowers had applied for loan forgiveness and only 423 applicants had been approved, fewer than 1% (FSA, 2018). Nearly three-fourths (72.5%) of applications had been denied due to program authorities determining that program requirements were not met, while an additional 26.6% of applications were denied due to incompleteness or missing information. A report issued by the CFPB (2017) investigated borrowers' complaints about loan servicers and found evidence that servicers provided inaccurate information and otherwise made some individuals ineligible for participation, a fact often learned too late by borrowers. While the government has instituted a Temporary Expanded Public Service Loan Forgiveness program (FSA, n.d.-c) to help PSLF applicants receive loan forgiveness, this program's success has also been limited (Lieber, 2018).

Teacher's Loan Forgiveness Program. The TLFP, also known as the Stafford Teacher Loan Forgiveness program, is the largest teacher-specific loan forgiveness program available through the federal government. Participation in this program has grown annually and TLFP had 298,000 participants in 2014, 53 times the number of participants than it had in 2004 (GAO, 2015). In order to participate in TLFP, teachers must be highly-qualified and working full-time in a low-income school or education-based service agency for five complete and consecutive years (FSA, n.d.-g). To be considered highly-qualified, program participants must have attained at least a bachelor's degree and received full state certification as a teacher, without any requirements waived. The U.S. Department of Education issues an annual directory of eligible schools and educational service agencies to help teachers determine their eligibility. Teachers who meet these criteria must also have Direct or Stafford Subsidized or Unsubsidized Loans, and at least one of their five years of service must have been after 1997-1998 (FSA, n.d.-g).

Like the NCTFP, the TLFP is designed to promote and reward teacher entry into the highest subject-area needs in the U.S., namely STEM and special education. The TLFP forgives up to \$17,500 in student loans for special education or secondary math or science teachers and up to \$5,000 for teachers in all other subject areas. To participate in the TLFP, eligible participants apply for loan forgiveness after they have met the five years of teaching requirements (FSA, n.d.-g). There is no research available on this program.

Perkins Loan Cancellation for Teachers. A second federal program directed specifically at teacher loan forgiveness is the PLCT. Only teachers in specified high-needs schools and/or positions (low-income schools and high-needs subject areas including mathematics, science, foreign languages, or bilingual education, and other subject shortage areas identified by a state education agency) who have Perkins Loans are eligible for this program. Perkins loans are federal loans for undergraduate and graduate students who have “exceptional financial need,” although the program was discontinued in 2017 (FSA, n.d.-a). Eligible PLCT participants may have loans cancelled in increments of their service (15% of loans cancelled for each of their first and second years, 20% cancelled for second and third years, 30% cancelled for the fifth year), with the full amount cancelled after five eligible years (FSA, n.d.-a). This program also cancels loan interest by year. As institutions are the lenders of Perkins Loans, borrowers must work with their respective institutions to participate in this program. Unlike the TFLP, the PLTC has seen a significant decrease in participation over time, which the GAO (2015) attributed to a lapse in Congressional funding for Perkins Loans, before final disbursements were provided in June 2018. Like the TLFP, there is no research available on this program.

TEACH Grant. The federal TEACH Grant program is featured here as an interesting model for comparison to the North Carolina Teaching Fellows Program based on similarities in the programs’ structures. Because research on the new NCTFP is unavailable due to the

program's recent start, outcomes from the TEACH Grant may be instructive for identifying potential strengths and weaknesses of a loan forgiveness program that comes with strict post-graduate eligibility guidelines. However, while outcomes of this program may be insightful, critical differences between the programs remain and research on the TEACH Grant is not fully transferable to the NCTFP. Still, I provide an in-depth overview of the TEACH Grant policy.

First implemented in 2008 by the College Cost Reduction and Access Act (GAO, 2015), the TEACH Grant provides up to \$4,000 per year for undergraduate, post-baccalaureate, or graduate students enrolled in eligible degree programs at participating institutions (FSA, n.d.-d). Maximum TEACH Grant amounts have been reduced for recent academic years by the Budget Control Act of 2011, with the award maximum at \$3,752 for 2018-2019 recipients (FSA, n.d.-d; GAO, 2015). Students must complete a FAFSA and meet basic eligibility criteria for federal student aid programs to apply. Institutions with teacher preparation programs may participate in the TEACH Grant program and, overall, institutional participation is relatively low. Institutions are responsible for choosing which of their degree programs qualify students for TEACH Grants (students must prepare for high-need fields) and responsible for administering the grants. Student participants must meet academic achievement requirements, either via high performance on college admissions tests or by maintaining a cumulative GPA of at least 3.25 (FSA, n.d.-d).

In exchange for grant money received, participating students agree to serve as a full-time teacher for at least four academic years at a low-income school or educational service agency in a high-need field within eight years of completing their degree (FSA, n.d.-d). High-need fields include bilingual education and English language acquisition, foreign language, mathematics, reading specialists, science, special education, and other programs deemed high-need by federal, state, or local governments (FSA, n.d.-d). Failure to meet program conditions results in the conversion of grant money to loans, with interest based on disbursement date. As of 2015, over

410,000 students had received TEACH Grants, although the number of students enrolling in the program has generally declined over time (GAO, 2015).

While the TEACH Grant intends to serve as a policy response to teacher shortages in low-performing schools and high-needs subjects, the program has had little success. Reports on the TEACH Grant suggest that only a small minority of participants have successfully received loan forgiveness, with the majority of participants seeing the money eventually converting to a loan (Barkowski et al., 2018; Carter, 2018; CFPB, 2017; GAO, 2015; Lobosco, 2018; Turner & Arnold, 2018a, 2018b). While one report found that 63% of TEACH Grant recipients had their TEACH Grant funding converted to loans (Barkowski et al., 2018), more recent reports estimate that these numbers may be higher, due in large part to administrative errors from ACS Education Services, the company in charge of the certification process (Carter, 2018; Turner & Arnold, 2018a). If TEACH Grant money were categorized as a loan in students' financial aid packages rather than a grant, 42% of TEACH Grant recipients would have exceeded the annual federal loan limit for borrowers which could have detrimental long-term effects for program participants who end up repaying the grant money originally received. Thus, while 89% of participating TEACH Grant students expect to receive the loan forgiveness benefits, a much smaller percentage actually do (Barkowski et al., 2018; Carter, 2018; CFPB, 2017; GAO, 2015; Kreighbaum, 2018; Turner & Arnold, 2018a, 2018b).

Estimates suggest that among students and graduates who had grants converted to loans, 86% of cases were involuntary (GAO, 2015). Of participants who had grant money converted to loans, participants were most likely to attribute employment—that their position didn't qualify for service requirements, or that they were not teaching—as the primary reason (Barkowski et al., 2018). Teachers in non-qualifying positions reported that they could not find eligible employment (15%), changed their mind about teaching in high-needs fields or schools (15%),

did not receive qualifying job offers (14%), found a higher paying job at a non-qualifying school (13%) or other reasons (43%) such as the school they were teaching at losing its high-need designation, layoffs, etc. (Barkowski et al., 2018). Based on these outcomes, an evaluation of the TEACH Grant found that a common practice is to make the funding available only to third- and fourth-year students based on the likelihood that students earlier in their college careers may not yet be ready to commit to teaching careers and to teaching at low-performing schools (Barkowski et al., 2018). A lack of understanding of program terms and requirements and/or a lack of a readiness to make career decisions can have critical implications for TEACH Grant participants. Those who participate in the TEACH Grant or who enroll in loan forgiveness programs may make decisions based on the expectation of loan alleviation, only to find themselves with unexpectedly large amounts of debt when terms are not met (Carter, 2018; CFPB, 2017; Kreighbaum, 2018; Tuner & Arnold, 2018a, 2018b).

State loan forgiveness programs for teachers. Loan forgiveness programs can be found at all levels of government, with many programs occurring at the state level. As of 2017, 35 states had proposed or created some type of loan forgiveness program (Perna, Kvaal, & Ruiz, 2017) and a number of states and private entities have created loan forgiveness programs specifically for teachers (AFT, n.d.). While dated, one older study found that 27 states offer college scholarships or forgivable loan programs where participating students and graduates receive financial benefits for in-state post-graduate teaching service (Hirsch et al., 2001). While requirements and conditions vary from one program to the next, each tends to set academic requirements for student participation based on GPA and/or standardized test scores, with programs requiring earned licensure and entry into teaching positions (Hirsch et al., 2001). Some programs additionally require participants to teach in certain types of schools, including those

that serve high proportions of low-income students, low-performing schools, and/or high-needs schools in rural or urban areas (Hirsch et al., 2001; Kolbe & Strunk, 2012).

North Carolina Forgivable Education Loans for Service. Although the NCTFP is the focus of the present study, North Carolina has another loan forgiveness program that non-NCTFP future teachers could be eligible for, the Forgivable Education Loans for Service (FELS) program. Introduced by the state's General Assembly in 2011, FELS was established to "lessen identified critical employment shortages...target[ing] future teachers, nurses and allied health professionals" (NCSEAA, 2016, p. 4). Eligible degree, certificate, or licensure programs for future teachers include biology, chemistry, science, English as a second language, foreign language, math, middle grades, physics, special education, or school psychology subject areas (College Foundation of North Carolina [CFNC], 2019). The amount of funding FELS participants receive is related to their degree level and credit hours, with full-time bachelor's students receiving \$1,500/semester, and full-time master's students receiving \$5,000/semester and participants must meet GPA minimums in order to qualify (CFNC, 2019). Like with the NCTFP, FELS participants have a 10-year repayment window in which loans must be paid back in qualifying service or in cash with an 8% interest rate. In FELS, one year of full-time qualifying service as a teacher in a public or charter school relieves one year of loans received (NCSEAA, 2016). FELS recipients cannot receive funding with other state-funded loans, thus preventing Teaching Fellows from participating in both programs (CFNC, 2019). There is currently no research on the outcomes of participants in the FELS program.

North Carolina Teaching Fellows Program

The North Carolina Teaching Fellows program is another state-level loan forgiveness program in North Carolina. Like the TEACH Grant, the NCTFP provides funding upfront to enrolled students, loan money that must be paid back via post-graduate service in specified

subjects. Unlike the TEACH Grant, the NCTFP also provides programmatic support and enrichment activities for participating students (NCTFP, 2017). The following section provides an in-depth overview on the NCTFP, detailing both the original version of the program and the new version of the restructured program NCTFP that is currently in its inaugural year. For a quick comparison of the original and new versions of the NCTFP, see Table 1.1.

1987-2011 North Carolina Teaching Fellows Program. As teacher hiring increased nationally in the 1980s with rising student enrollment and decreasing student-teacher ratios (Ingersoll et al., 2014), North Carolina too began to focus on improving the state's education system (PSFNC, 1986). By the 1980s, the state's primary industries, tobacco, textiles, furniture and farming, had been declining and the state held a low national ranking in education. In 1986, state politicians assembled leaders in education, government, and business to form a coalition, the Public School Forum of North Carolina, to create a unified approach to improving the education workforce in the state (PSFNC, 1986).

In their report detailing teacher workforce challenges in North Carolina, *Who Will Teach Our Children*, the Forum described the "diminishing pool of capable teachers" as "the most formidable challenge facing policymakers in 1986" (PSFNC, 1986, p. 6). The Forum's report described high rates of anticipated teacher retirements, high teacher attrition rates, declining enrollment of college students in teacher preparation programs, and increasing student enrollment, anticipating a great need for growing the state's teacher workforce (PSFNC, 1986). The Forum reported concerns about the declining academic ability of students entering teaching careers in the state, also noting a need for greater diversity within the profession, especially the need for more teachers of color, men, and students from rural areas (PSFNC, 1986). Finally, the Forum noted the increasing difficulty rural areas were facing in teacher recruitment due to the

lack of housing, economic development, and the absence of salary supplements for teachers in these areas (PSFNC, 1986).

In the report, two top priorities were identified: meeting the demand for teachers over the next decade and the need to counter the “declining appeal of the teaching profession” by recruiting high-ability students into teaching careers (PSFNC, 1986, p. 6). Considering these constraints, the Forum suggested that North Carolina adopt a new policy in the form of grants “treated as loans” (PSFNC, 1986, p. 7) to incentivize high-achieving high school students to enter teaching careers. As a result of these efforts, the North Carolina Teaching Fellows Program (NCTFP) was born.

The first version of the NCTFP was adopted by the North Carolina General Assembly in 1986 based on the Forum’s recommendations. The policy was designed to recruit annual cohorts of high-achieving incoming college students, especially racially minoritized students and men into teaching careers. To do so, the program provided financial incentives in the form of grant money received during college that could be paid off in either post-graduate teaching service or in cash with 10 years of Fellows’ college graduation (Cohen, 2015; PSFNC, 1986). The NCTFP was administered by the Public School Forum of North Carolina, overseen by a designated group of education, business, and government leaders serving as the North Carolina Teaching Fellows Commission, and funded through annual appropriation by state legislators (Cohen, 2015; Denning, 2008).

Starting in 1987, 400 scholarships were granted to Teaching Fellows who received \$5,000 a year for up to four years (Cohen, 2015). Funding was provided to Fellows on the condition that they would give one year of teaching in a North Carolina public school for each year of grant funding received, resulting in at least four years of teaching within 10 years of their college graduation, or cash repayment of the money with 10% interest. In 1998, annual funding

was increased to \$6,500. While funds “were not intended to cover the entire cost of college attendance” (NCOSA, 2003, p. 1), loan amounts were increased to retain purchasing power in the context of fast-growing college costs at public institutions in the state (NCOSA, 2003). In 2006, the program expanded to admit 500 Fellows per year (Cohen, 2015). In 2011, the program admitted its final cohort, with the last of the original Teaching Fellows funded for four years of college, through 2015 (Adams, 2017; Cohen, 2015). In 2011, a newly elected General Assembly defunded the program as part of significant cuts to the North Carolina’s education budget. According to media accounts, the program’s end was met with great disappointment (Fitzsimon, 2015), “leav[ing] a big gap in the pipeline for excellent teachers” (Cohen, 2015, p. 1).

Fellows selection. While in operation, the Teaching Fellows program followed the Forum’s original vision, successfully attracting high-achieving students into teaching (Henry, et al., 2012). Selection into the program became more competitive each year and in its final year, the original NCTFP received over 2,000 applications for 500 spots (Cohen, 2015). The North Carolina Teaching Fellows Commission oversaw the program’s recruiting, a statewide effort that included over 1,200 people serving on selection committees across school districts, with finalists advancing to regional interview processes (Cohen, 2015). Applicants highlighted their academic aptitude and standing as well as leadership and extracurricular activities for selection (Henry et al., 2012). Race, gender, and geographic diversity were considered based on the program’s goals of increasing the number of racial minorities, men, and students from rural counties into teaching professions (Cohen, 2015; PSFNC, 1986). All applicants were also required to be U.S. citizens and legal residents of North Carolina who planned to become teachers (Clewell & Forcier, 2001). Fellows accepted into the program were additionally required to maintain a 2.5 GPA throughout college (Clewell & Forcier, 2001).

Student applicants were high school seniors who rank-ordered partner institutions as part of the application process. Awardees were granted Teaching Fellows scholarships for a specific institution based on availability at the institution and acceptance by the university. By the program's conclusion, partner campuses included 17 postsecondary institutions in the state, 12 public and five private institutions (Table 2.1; Henry et al., 2012). Notably, most private institution partners would match the financial contributions of the state in their financial support of Fellows on their campuses (J. Carpenter, personal communication, November 26, 2018). In order to participate in the Teaching Fellows program, campuses were required to provide extra services and teacher preparation training to Fellows, including applied teaching experiences beginning in the Fellows' first year (Cohen, 2015; Henry et al., 2012). Each campus provided its own professional development activities in addition to those offered by the state (Clewell & Forcier, 2001; Denning, 2008; NCTFP, 2007).

Table 2.1

Institutional Partners for the Original NCTFP

Public Institutions	Private Institutions
Appalachian State University	Campbell University
East Carolina University	Elon University
North Carolina A&T University	Lenoir-Rhyne University
North Carolina Central University	Meredith College
North Carolina State University	Queens University
UNC Asheville	
UNC Chapel Hill	
UNC Charlotte	
UNC Greensboro	
UNC Pembroke	
UNC Wilmington	
Western Carolina University	

Professional development and enrichment activities were a major component of the original NCTFP. Each summer, the NCTFP led large-scale professional development programs for all Fellows in addition to experiences that Fellows participated in on their respective

campuses. The summer activities, coordinated by the Public School Forum were designed to “enhance the campus program and give insight into the challenges facing students when they enter the classroom” (JLEOC, 2007, p. 3). The programs additionally intended to foster a sense of “spirit de corp” and to encourage networking and the development of support systems among Fellows (JLEOC, 2007, p. 3). During the summer after their first year, Fellows participated in a DISCOVERY TRIP, a seven-day trip across the state to visit schools, farms, and corporate environments to understand the diversity of the state and the impact of economic conditions on schools (JLEOC, 2007). After their second year, Fellows could select a summer enrichment option, including workshops, outdoor education programs, traveling abroad, and taking courses. Summers concluded with a conference about preparing students to work with diverse student populations (JLEOC, 2007). After their third year, Fellows attended an orientation week in a school system, interacting with school staff, including teachers, superintendents, curriculum advisors, personnel directors, transportation directors, custodians, and local government bodies as an introduction to the operation of a school system. After the week, Fellows participated in a three-day conference to support their professional development and eventual entry into teaching positions within the state (JLEOC, 2007).

Program outcomes. Overall, the first Teaching Fellows program was largely viewed as a success. Over 10,700 students participated in the program, with 8,523 graduates (Cohen, 2015), representing about 10% of all newly credentialed teachers in North Carolina during the program’s operation (Podolsky & Kini, 2016). As of 2013-2014, over 4,600 Fellows were teaching in all 100 counties in North Carolina (Cohen, 2015). Over its duration, the program provided \$253.1 million in scholarships to Fellows (Cohen, 2015).

Eighty-five percent of students who began college enrolled in the NCTFP completed the program through their graduation (PSFNC, 2008). The program claims higher graduation rates

for Fellows in comparison to all undergraduates in the UNC system, who have an overall graduation rate of 54% (PSFNC, 2008). Further, the NCTFP claims higher proportions of its Fellows both entering and staying in teaching careers in comparison to national rates for graduates of teacher preparation programs. The PSFNC cites that 66% of all education undergraduate students across the country become teachers in the year following their college graduation, compared to 78% of Teaching Fellows (PSFNC, 2008). Further, while only 51% of education graduates who entered teaching remained in the career after five years, 85% of Fellows did so (PSFNC, 2008). Thus, the PSFNC asserts that “the rate of return on investment in the Teaching Fellows is nearly double that of other education majors” (PSFNC, 2008, p. 8).

A 2012 evaluation of the original program provided additional insight into the NCTFP’s strengths and weaknesses. According to the evaluation, the two primary strengths of the NCTFP were the program’s success in recruiting high-achieving high school students into teaching careers and in promoting higher teacher retention rates among Fellows (Henry et al., 2012). In comparison to other public school teachers in North Carolina, Teaching Fellows were found to have higher academic ability based on SAT scores, high school GPAs, and high school class rank (Henry et al., 2012). Fellows averaged a 1141 SAT score (out of 1600), a 3.8 high school GPA, and a class rank of 14 (out of an average class size of 213; Cohen, 2015). Additionally, 90% of Fellows returned for a third year of teaching, with 75% continuing for a fifth year, demonstrating higher early-career retention rates than other public school teachers in the state (Henry et al., 2012). Similarly, Cohen (2015) reported that 64% of Fellows who completed their four-year service requirement were still teaching and, by the time of his report, over 200 Fellows in the original program had become principals or assistant principals.

While initial findings suggested that Teaching Fellows had higher student gains in student test performance for elementary and middle school math and in high school, a more

advanced propensity score analysis that matched Fellows with teachers of similar academic credentials made these initial results null (Henry et al., 2012). This result suggests the likelihood that that positive effects of Teaching Fellows on student achievement may not necessarily be attributed to the program itself, but of the human capital of the Fellows, and of other high-achieving teachers (Henry et al., 2012). This concept is consistent with research that finds that teachers with high academic ability tend to be more effective (Clotfelter et al., 2010; Walsh, 2014), which is a benefit of the NCTFP's focus in recruiting high-achieving students into the career. Additional benefits of the program that may have aided teacher effectiveness were the enhanced practical experiences that the program offered, as well as the cultural and diversity training and experiences that Fellows participated in (Henry et al., 2012), which are two preparation strategies associated with teacher effectiveness (Cochran-Smith et al., 2015; Liou & Lawrenz, 2010).

Despite the initial NCTFP's overall metrics of success, the evaluation identified several weaknesses as well. Henry et al. (2012) did not find the NCTFP to be successful in recruiting more racially minoritized students or men into the teaching profession, despite its goal in doing so. Instead, Teaching Fellows were actually less likely than other North Carolina public school teachers to fit these identities (Henry et al., 2012). Further, the original program's structure was critiqued as well, namely in its lack of focus on high-needs areas experiencing greater teacher shortages, including low-performing and/or low-income schools (Khrais, 2015). Instead, most Teaching Fellows ended up teaching in relatively high-income and high-performing schools (Henry et al., 2012). Similarly, the NCTFP did not target high shortage subjects such as STEM or special education. Suggestions for new versions of the program included targeting areas where teachers were most needed (Cohen, 2015), or recruiting students while they were already enrolled in college, instead of focusing specifically on high school students (Khrais, 2015).

Notably, a dissertation study on the NCTFP examined the experiences of Fellows in the teacher workforce also produced worrying results: Fellows reported relatively low levels of job satisfaction compared to other North Carolina teachers, especially during their four years of required service (Denning, 2008).

Teacher service and loan repayment. Another challenge of the original NCTFP, but one that remains minimally explored, is the rate of Fellows paying their loan money back in teaching service compared to cash. Ideally, all Fellows would enter teaching positions and pay back loans in service. However, this was not the case. While rates of successful NCTFP teacher service completion far exceed those of the TEACH Grant program as a similar model, a substantial number of Fellows ended up paying their grant funds back in cash instead of completing teaching service. Figures from a 2003 audit show that 71% of Fellows had paid back their loans in teacher service, 29% in cash (NCOSA, 2003). Updated figures from a 2015 report show similar results; 30% of Fellows paid back loans in cash instead of service. By 2015, Cohen reported that 7,157 Fellows had paid back the scholarship money in teaching service or were in the process of doing so. However, 2,959 Fellows were paying back the loans in cash, thus not meeting teaching requirements. At the time of Cohen's (2015) report, 536 Fellows were still enrolled in college. Thus, while most Fellows successfully met all program requirements and received full financial benefits, it is notable that a significant portion of Fellows did not. Unfortunately, current data on the service completion and loan forgiveness status of original participants is unavailable (S. Ulm, personal communication, January 29, 2019).

2018-2019 North Carolina Teaching Fellows Program. Despite shortcomings, the original NCTFP was widely regarded as a model state-level teacher preparation and incentive program (Carver-Thomas & Darling-Hammond, 2017a, 2017b; Clewell & Forcier, 2001; Cohen, 2015; Hirsch et al., 2001; Kelly & Northrop, 2015; Podolsky & Kini, 2016). In the program's

absence, North Carolina continued to face many of the same teacher workforce challenges of the past without the same support. In 2015, 90 school districts reported having difficulty finding teachers for high school math (Stancill, 2017a), with math, science, and special education as the “areas of most need in the state” (NCSEAA, 2017, p. 4). Additionally, consistent with national trends, between 2010 and 2016 public postsecondary institutions in North Carolina saw student enrollment in teacher preparation programs decline by 30%, contributing to continued worries about the supply of qualified teachers in the state, especially in STEM and special education (Adams, 2017; Bastian & Watts, 2016; BEST NC, 2018; Stancill, 2017a).

In 2017, continued attention to and concern for the education workforce in North Carolina led to a bipartisan reintroduction of the North Carolina Teaching Fellows Program beginning in the 2018-2019 academic year (NCSEAA, 2017; S.B. 252, 2017-2018 Session, 2017). The NCTFP is administered by the UNC System office along with the State Education Assistance Authority and the Teaching Fellows Commission (NCSEAA, 2017). Like with the original NCTFP, the North Carolina Teaching Fellows Commission is comprised of education, business, and government leaders across the state, with 14 members in total, including a program director, and is authorized to determine selection criteria and procedures for both academic partner programs and recipients (NCSEAA, 2017; UNC System, 2017). To start, the program was allotted \$250,000 for implementation, and \$6 million in recurring funds to operate the program (S.B. 252, 2017-2018 Session, 2017), and funding for the new program is contingent on annual appropriations by General Assembly to the State Education Assistance Authority (NCSEAA, 2017). While the current program provides more money to Fellows (up to \$8,250/year), it is significantly more limited in terms of both size and scope than its predecessor. In the 2018-2019 academic year, the NCTFP was funded for a maximum of 160 Fellows to participate across at five partner institutions, far smaller than the 500 students at 17 institutions in

the prior program. Further, participation in the new program is limited only to students preparing for teaching careers in STEM education or special education.

Partner institutions. The five partner institutions hosting the new NCTFP were all former participants in the prior version of NCTFP and were selected among 16 applicant institutions (UNC System, 2017), with both public and private institutions purposefully represented (NCTFP, 2017). Institutional partners were selected by the NCTFP Commission based on “stringent standards” and evidence of hosting “the most effective educator preparation programs” (NCTFP, 2017, p. 27). Partner institutions were chosen based the following criteria:

- (1) Demonstrates high rates of educator effectiveness on value-added models and teacher evaluations, including using performance-based, subject-specific assessment and support systems, such as edTPA or other metrics of evaluating candidate effectiveness that have predictive validity.
- (2) Demonstrates measurable impact of prior graduates on student learning, including impact of graduates teaching in STEM or special education licensure areas.
- (3) Demonstrates high rates of graduates passing exams required for teacher licensure.
- (4) Provides curricular and co-curricular enhancements in leadership, facilitates learning for diverse learners, and promotes community engagement, classroom management, and reflection and assessment.
- (5) Requires at least a minor concentration of study in the subject area that the candidate may teach.
- (6) Provides early and frequent internship or practical experiences, including the opportunity for participants to perform practicums in diverse school environments.
- (7) Is approved by the State Board of Education as an educator preparation program (NCTFP, 2017, pp. 27-28).

Selected partner institutions include three public institutions: NC State University, UNC Chapel Hill, UNC Charlotte, and two private institutions: Elon University and Meredith College. Table 3.1 provides basic profiles on each of the partner institutions. Nine other institutions applied but were not selected: Appalachian State University, Campbell University, Catawba College, East Carolina University, Gardner-Webb University, North Carolina A&T University, Queens University, UNC Greensboro, UNC Pembroke, UNC Wilmington and Western Carolina University (Stancill, 2017b).

Table 2.2

Number of Teaching Fellows by Campus

	Total number of NC Teaching Fellows as of Spring 2019
Elon University	8
Meredith College	7
NC State University	25
UNC Chapel Hill	15
UNC Charlotte	19

Note: Source: UNC System, 2019; confirmed by personal communication with campus program leaders

As a new program that was established less than a year before implementation, the NCTFP offers little structure for partnering institutions in terms of standardized programming and expectations. As a result, the program is structured differently across campuses in size, staffing, and activities and requirements for current Fellows. Notably, both Elon and Meredith had maintained their own private Teaching Fellows programs once the original NCTFP was defunded, although the structure of the program changed at both campuses (H. Bower, November 26, 2019; J. Carpenter, November 26, 2019). Neither program set subject-specific eligibility for student participants (i.e., the programs are not exclusive to students preparing for STEM or special education teaching careers) and both dropped post-graduate teaching requirements, turning awards into grants or scholarships rather than forgivable loans. Both campuses subsumed new NCTFP participants into their already-established enrichment activities

for their own private Fellows programs. At both campuses, the private Teaching Fellows programs are far larger than their inaugural cohorts of NCTFP participants (H. Bower, November 26, 2019; J. Carpenter, November 26, 2019). On all three public partner campuses, infrastructure for hosting Teaching Fellows was completely rebuilt.

Across the five partner campuses, each has at least one faculty or staff director and/or coordinator who lead(s) the program by recruiting prospective Fellows, planning and coordinating enrichment activities on their campuses, communicating with statewide program administrators, and more. Current program leaders on all five campuses bring institutional knowledge and academic expertise to the program; at two sites, coordinators were members of the original NCTFP. At both private institutions, the program coordinator(s) had leadership roles on their respective campuses during the original NCTFP. NCTFP leaders on four campuses also hold faculty appointments.

Criticism of institution selection. The set of partner institutions selected for the new NCTFP has been subject to criticism based on their limited geographic and racial diversity (Ford & Lindsay, 2017; Hui, 2017). All five selected institutions are predominantly White institutions despite the great need for racially minoritized teachers in the state (BEST NC, 2018; Ford & Lindsay, 2017; Hui, 2017; Stancill, 2017b). In particular, the president of the state's National Association for the Advancement of Colored People (NAACP) expressed public concern about the absence of Historically Black Colleges and Universities (HBCUs) from the list of partner institutions, explaining that the lack of HBCUs was particularly problematic in the context of the state's history of educational disparity and segregation (Stancill, 2017b). In the original NCTFP, two partner institutions of 17 were HBCUs: North Carolina A&T University and North Carolina Central University. Two minority-serving institutions, North Carolina A&T University and UNC Pembroke (an American Indian/Alaskan Native-serving institution) applied as partner

institutions for the new NCTEP, but neither was selected. Unlike its predecessor, legislation related to the new NCTFP does not identify racial diversity as a primary recruiting objective of the program (JLEOC, 2018). Table 2.3 displays the demographic characteristics of the five partner institutions' undergraduate student populations.

Table 2.3

Undergraduate Demographic Distributions of NCTFP Partner Institutions

	Elon University	Meredith College	NC State University	UNC Chapel Hill	UNC Charlotte
<i>Gender</i>					
Female	60%	100%	45%	59%	53%
Male	40%	0%	55%	41%	47%
<i>Race</i>					
American Indian/Alaskan Native	0%	1%	0%	0%	0%
Asian	2%	3%	6%	11%	7%
Black/African American	5%	8%	5%	8%	17%
Hispanic/Latino	6%	8%	5%	8%	10%
Native Hawaiian/Pacific Islander	0%	0%	0%	0%	0%
White	80%	71%	69%	62%	57%
Two or more races	3%	4%	4%	4%	4%
Race/ethnicity unknown	0%	4%	5%	4%	2%
Non-resident alien	2%	2%	5%	3%	3%

Notes. All figures are from the National Center for Education Statistics' (NCES) College Navigator tool based on Fall 2017 data (NCES, n.d.-b)

In addition to concerns about the lack of racial diversity, the selection of partner institutions also represents limited geographical diversity within the state. All five partner institutions are located centrally and proximal to the state's most populous areas. Three partner institutions (Meredith College, NC State University, and UNC Chapel Hill) are located within a single metropolitan area (Raleigh-Durham-Chapel Hill, the state's "Research Triangle"), with UNC Charlotte located in Charlotte, the state's most populous city, and the fifth institution, Elon University, located between these two metropolitan areas. No institutions from the state's western-most mountainous region, nor the eastern-most coastal regions are represented. As the more rural regions in North Carolina are located on the state's outskirts, the lack of partner

institutions in these areas could limit the participation of rural students in the program, especially as college-going students from rural areas often attend institutions close to home (Hillman, 2016). Rural schools tend to have some of the most difficult time attracting teachers, especially due to limited budgets and lower salary supplements in North Carolina (NCACC, 2017).

Program eligibility. While the new NCTFP has many similarities to the original program, changes have been made to narrow the program's focus in order to address teacher shortage areas more directly:

The [NCTFP] will provide a pathway to teaching that is open to a diverse pool of applicants that includes high school students, college and college transfer students, and individuals who already have a bachelor's degree and wish to pursue coursework for teacher licensure. This, in turn, will help recruit and retain greater numbers of highly qualified teachers in special education and STEM fields and to create a robust pipeline for providing highly qualified teachers for low-performing schools (JLEOC, 2018, p. 22)

Thus, instead of being available to all students preparing for teaching positions, the current NCTFP limits eligibility to specific subject areas based on state need: STEM subjects and special education. Eligible STEM and special education licensure areas are identified by the state's Superintendent of Public Instruction annually based on the "number of available positions in each licensure area relative to the number of current and anticipated teachers in that area of licensure" (NCTFP, 2017, p. 28). Eligible academic programs are approved by the NCTF Commission (NCSEAA, 2017). Current eligible licensure programs in STEM subjects include high school (grades 9-12) mathematics, science, earth science, physical science, biology, physics, chemistry, middle school (grades 6-9) mathematics, science, and technology, and middle and high school (grades 6-12) agriculture and technology education (NCTFP, n.d.).

Education level. While the new NCTFP narrowed eligible subject areas, the program has eligibility to students in various points of their postsecondary education. Prospective Fellows can now apply for the program as a (a) high school senior attending a school located in North Carolina, (b) currently enrolled student seeking to transfer to one of the partner institutions and into an approved academic program at the institution, (c) currently enrolled student at one of the partner institutions with over 24 hours of college credit hours seeking to transition into an approved academic program at their institution, or (d) bachelor's degree holder planning to pursue either licensure or a master's degree in education (NCSEAA, 2017; NCTFP, 2017). Approved academic programs are educator preparation programs in STEM or special education that have been deemed eligible by the NCTFP Commission (NCSEAA, 2017).

Importantly, the academic status of students when they enter the program influences the amount of financial support that they may be eligible for. Participants who are accepted into the NCTFP as new undergraduate students are eligible for four years of the \$8,250 maximum award, a total of \$33,000 over four years. Students with under 24 hours of college credits who transfer into a partner institution are eligible for institution are eligible for three years of the award, totaling up to \$24,750. Students with over 24 credit hours who join the NCTFP at the partner institution that they already attend and those who already hold bachelor's degrees are eligible for up to two years of awards, totaling \$16,500 (NCTFP, n.d.).

Selection criteria. Like its predecessor, the new NCTFP also aims to promote high-achieving students into the teaching profession via a competitive merit-based selection process. Selection of Teaching Fellows is based on the following criteria, established by the NCTF Commission: (a) grade point average; (b) performance on relevant career and college readiness assessments; (c) experience, accomplishments and other criteria demonstrating qualities positively correlated with highly effective teachers, including excellent verbal and

communication skills; (d) demonstrated commitment to serve in a STEM or special education licensure area in a North Carolina Public School; (e) available funds at the time the application is reviewed; (f) the intent of the applicant to complete an approved educator preparation program and to work in a qualifying teacher position; and (g) any other factor consistent with the purpose of the NCTFP (NCSEAA, 2018, p. 9-10).

Legislation for the new NCTFP does not set specific academic requirements; the Commission is invited to determine academic requirements annually (NCSEAA, 2017). Currently, high school or college applicants with fewer than 24 completed college credit hours are required to have an unweighted 3.0 high school GPA and scores of at least 24 on the ACT, or 1100 on the SAT (NCTFP, n.d.). College-level applicants with more than 24 credit hours need to hold at least a 2.7 GPA (NCTFP, n.d.). There are no specified academic criteria for bachelor's degree holders applying to the program (NCTFP, n.d.). Table 2.4 demonstrates academic requirements and financial eligibility depending on their point of entry into the program.

Table 2.4

NCTFP Eligibility Requirements and Funding Totals

Academic Status	Academic Eligibility Requirements	Total Financial Support Eligibility
North Carolina high school senior	Unweighted high school GPA of 3.0 or higher and have scored at least a 24 on the ACT or a 1100 on the SAT	8 semesters; up to \$33,000
Already enrolled student with fewer than 24 college credit hours	Unweighted high school GPA of 3.0 or higher and have scored at least a 24 on the ACT or a 1100 on the SAT	6 semesters; up to \$24,750
Already enrolled student with more than 24 credit hours	More than 24 hours of college credit and 2.7 minimum cumulative GPA	4 semesters; up to \$16,500
Bachelor's degree holder (pursuing teacher licensure)	There are no specified academic criteria.	4 semesters; up to \$16,500

Independent of applying to the NCTFP, students must be admitted to one of the Teaching Fellows partner campuses. The NCTFP award is “portable” (S. Ulm, personal communication, January 29, 2019), and students accepted to multiple campuses can select which institution they would like to attend in order to participate in the program. Because each partner institution has a different academic profile, it is possible for students to receive admission to a partner campus, but to still be ineligible for the NCTFP based on the academic minimum requirements listed above. At Meredith College, an ACT composite score of 25 and an SAT score of 1195 represent the 75th percentile (top 25%) of the institution’s current students (NCES, n.d.-b), suggesting that only a minority of current or prospective undergraduate students at the institution would be eligible for the NCTFP program.

Application and selection process. Prospective Fellows must apply independently to the partner institutions where they are interested in serving as Fellows. Applicants must submit their SAT or ACT scores and a high school and/or college transcript, as applicable (NCTFP, n.d.). The NCTFP application asks candidates to provide their academic and personal accomplishments and awards, leadership experience, and commitment to teaching (NCTFP, n.d.). Applicants also must write brief essays about why they are pursuing teaching, including why they wish to teach in STEM or special education, and a time when they experienced an obstacle and lessons learned from the experience (NCTFP, n.d.). Similar to the original program design, finalist candidates are interviewed by a panel of former Teaching Fellows and current educators, school administrators, business and community leaders, legislators and other program stakeholders in March (NCTFP, n.d.). In 2018, interviews were hosted at community college campuses at six locations across the state (Strange, 2018). The Commission selects the new cohort of Teaching Fellows from this process, who are then notified of their status by April 1 (NCTFP, n.d.).

Requirements while enrolled. In order to receive full program benefits, Fellows must meet initial eligibility requirements and remain in good standing with NCTFP via demonstrating satisfactory academic progress, remaining continuously enrolled in their approved education program, and participating in required NCTFP enrichment activities at state and institution levels (NCSEAA, 2017). Fellows must submit annual loan renewal applications to receive funding each year (NCSEAA, 2017). Fellows must additionally complete requirements for their academic program, pass required certifications and/or licensure exams and honor the terms of the promissory note (NCSEAA, 2017).

Loan terms and repayment. New Fellows are eligible for an annual maximum of \$8,250 in forgivable loans. While the terms “loan forgiveness” and “forgivable loans” are used in reference to the financial benefits afforded to Fellows across all program documents (e.g., NCSEAA, 2017, NCTFP, n.d.), Fellows receive the full amount of allocated money each semester, quarter, or year—depending on the institution—in which they are participating in the NCTFP. Loan forgiveness refers to the attached repayment requirements for money received; funding can be paid back either in the form of completing eligible teaching service or as a cash payment if teaching service is not completed. While \$8,250 serves as a maximum annual loan amount, individual loan amounts are determined by the State Education Assistance Authority based on available funds, a Fellow’s cost of attendance, other financial aid received by the Fellow, and by the program that the Fellow is enrolled in (NCSEAA, 2017). Thus, the annual loan amount received by a Fellow may actually be less than \$8,250. Additionally, some institutions may optionally offer their own financial supplements in addition to funding that Fellows receive from the state (J. Carpenter, personal communication, November 26, 2018). Loan amounts are approved annually (NCSEAA, 2017).

In addition to targeting shortage subject areas in STEM and special education, the new NCTFP is also designed to promote teacher entry into “low-performing” schools in the state, identified by performance grades given by the State Board of Education Department of Public Instruction (DPI; NCTFP, 2017). The DPI creates School Report Cards for all public schools in the state, assigning each school performance letter grades of A through F. Performance grades are based predominantly (80%) on a school’s achievement score, calculated from a composite of test measures for the school and based on academic growth (20%), comparing student performance to expected performance based on a predictive model (NCDPI, n.d.). Low-performing schools are those that have received a D or F performance grade and that earned a growth score of “met expected growth” or “not met expected growth” (NCTFP, n.d.). Of the 2,537 district and charter schools that received performance grades in 2017-2018, 480 schools, or 18.9%, were considered to be low-performing (DPI, 2018).

Although teaching at a low-performing K-12 school is not a requirement of service in the new NCTFP, the program design encourages it. Fellows who teach at low-performing schools have loans forgiven in half the time as Fellows who work at other schools. Loans are forgiven based on teacher service in eligible roles, with one year of loans (up to \$8,250) forgiven for either (a) one year of teaching service at a low-performing North Carolina public school, or (b) two years of teaching service at a North Carolina public school not considered low-performing (NCSEAA, 2017). Employment for less than a full academic year in an eligible role may qualify for partial forgiveness (NCSEAA, 2017). The extent to which partial completion of service is eligible for forgiveness will be determined by the North Carolina State Education Assistance Authority (S. Ulm, personal communication, January 29, 2019). Notably, if a school identified as low-performing becomes no longer identified as a low-income school during a Fellow’s

employment at the school, the loan continues to be forgiven at the same rate: one year of loans forgiven for one year of teacher service (NCSEAA, 2017).

Fellows who do not complete qualifying teaching service will be billed to repay the funding in monthly cash installments at an 8% interest rate (NCSEAA, 2017). The repayment period begins the September following the Fellow's graduation, or 90 days after the Fellow's termination from their approved program (NCSEAA, 2017). This is a shorter period than the six-month federal loan grace period (FSA, n.d.-e). During repayment, a Fellow may either be (a) employed in a qualifying teaching role, (b) paying loans back in cash, or (c) in approved deferment or forbearance (NCSEAA, 2017). The repayment period lasts for a maximum of 10 years. Fellows are required to communicate whether they plan to repay the loan in teaching service or in cash, as well as any employment changes to the State Education Association Authority (NCSEAA, 2017). Loan deferment is allowed for a number of circumstances in limited time allotments, including personal illness, family medical leave, unemployment, full-time college enrollment, military service, and national disasters (NCSEAA, 2017).

Interest rates. Participants in the NCTFP who do not complete teaching service are responsible not only for paying back the cost of their grant money, but also an 8% interest rate. By definition, interest is a percent of the principal amount on a loan that is unpaid and that cumulates daily (FSA, n.d.-f). While this interest rate is lower than the original program's 10%, it remains higher than those of many federal loan programs for undergraduate students. At the time of this study (loans disbursed on or after July 1, 2018 and before July 1, 2019), direct subsidized and unsubsidized federal loans for undergraduate students have a 5.05% fixed interest rate, the highest interest rate in eight years (FSA, n.d.-f). Fixed interest rates for graduate student unsubsidized loans and direct PLUS loans (for parents and graduate students) are higher, at 6.6% and 7.6%, respectively (FSA, n.d.-f). Interest rates on federal loans are set by law (FSA, n.d.-f).

One of the primary benefits of federal student loans is that these loans generally have lower interest rates than loans from private lenders (FSA, n.d.-f). However, students who participate in the NCTFP and who end up paying back their loans in cash instead of service incur higher interest rates than they would have if had taken out federal loans instead, a costlier financial outcome than not participating at all.

Lower interest rates lead to lower overall costs for student borrowers. As a result, rational choice theory would presume that students may weigh interest rates into their decision making. However, research suggests that students often have a limited information of financial aid systems. One-third of respondents to the 2016 National Postsecondary Student Aid Study (NPSAS) incorrectly answered a question about interest rates, showing a lack of understanding that interest continually increases an account balance over time (Anderson et al., 2018). While the role of interest rates in college student borrowing decisions is largely unknown, Dynarski (2014) argues that it is unlikely to have an impact for most borrowers. Outside of the lack of a conceptual understanding of interest rates, time-inconsistent preferences may also influence this dynamic, as interest rates tend to affect borrowers only in the future. Then, although the NCTFP has a relatively high interest rate in comparison to federal loans, it seems unlikely that this would deter students from participating in the program, especially among students who plan to pay back money with teaching service and thus may not expect to encounter loans, or interest, at all.

Enrichment activities. In addition to financial benefits, the NCTFP also provides, and requires, Fellows to participate in “unique enrichment opportunities and experiences that focus on developing the leadership potential of Teaching Fellows and instill a greater sense of purpose, service, and professionalism” (NCTFP, n.d., para. 3). Currently, NCTFP requires all Teaching Fellows to participate in four primary activities: a campus orientation, a Special Olympics or STEM experience, a Capstone Seminar, and a Fellows Gala (Table 2.5). All Fellows who receive

awards for more than two years are additionally required to participate in Mission Equip and Fellows who receive awards for three or four years are required to participate in a community outreach activity. Given the new nature of the program, most of the enrichment activities are loosely defined and still under development. In addition to participation in these events, Fellows will be offered an optional opportunity to visit the NC General Assembly to attend committee meetings, receive recognition in both chambers, and meet with legislators. Partner institutions are additionally responsible for providing their own activities and professional development opportunities for their students, but the structure of these enrichment activities vary by campus.

Table 2.5

NCTFP Enrichment Activities

Activity	Description	Participation Requirements
Campus Orientation	Hosted by each respective campus to introduce program expectations	All Fellows; required in Fall of first year
Mission Equip	3-day seminar at the North Carolina Center for the Advancement of Teaching in Cullowhee, NC focused on teambuilding, communication, and creating a sense of shared mission via group activities, discussions, visit to a low-performing school, and meetings with educators	Fellows who receive more than 2 years of funding; required in first year
Special Olympics/STEM Experience	Special education Fellows may volunteer with the NC Special Olympics games in the summer or fall; STEM Fellows may volunteer at the NC Science Olympiad Tournament, the annual NC Bridging the Gap STEM Education Conference, or another approved activity	All Fellows; required in second year
Community Outreach	20 hours of community service required in the third year, including participation in a designated of Teaching Fellows Day of Service	Fellows who receive more than 3 years of funding; required in third year
Capstone Seminar	Instruction on use of evaluation data; panel of NC Teachers of the year	All Fellows; required in final participation year
Fellows Gala	Dinner with legislators, business, and community leaders directly following the Capstone seminar; pinning ceremony with State Superintendent	All Fellows; required in final participation year

Note. Source: Espey (2018)

The new program's enrichment activities are another notable difference between the old and new NCTFPs. While the former NCTFP had well-developed enrichment programs, the new NCTFP is far more limited in this aspect of the program, at least for now. One popular enrichment activity in the former NCTFP was the DISCOVERY TRIP, a week-long trip throughout the state of North Carolina required of all Fellows. The trip highlighted the diversity of economic conditions, industries, and schools across the state and several program leaders report hearing that former NCTFP participants, some of whom are parents of current and prospective Fellows today, have been especially disappointed to see this part of the program gone (C. Espey, personal communication, October 23, 2018; H. Bower, personal communication, November 26, 2018).

For the new NCTFP, partner campuses are expected to provide the vast majority of the enrichment activities. Private institution partners Elon University and Meredith College maintained independent institutional-funded Teaching Fellows programs once the original NCTFP ended. As a result, both of these institutions already had appropriate development and training activities and a budget in place to support the enrichment programming of the new NCTFP participants (J. Fish, personal communication, November 26, 2018; H. Bower, personal communication, November 26, 2018). For the public institutions, this start-up was more challenging and required identifying personnel to lead the program and the rebuilding of infrastructure for enrichment activities. Campus coordinators noted that the state provided \$500 for campuses to operate enrichment programs (C. Espey, personal communication, April 18, 2019; H. Coffey, personal communication, April 18, 2019), an amount that covered less than half of NC State Fellows' transportation to the single statewide enrichment event in 2018-2019 (an estimated cost of \$1800; C. Espey, personal communication, April 18, 2019). Considering the breadth of activities that NCTFP partner campuses must provide Fellows, budgets to support

programming are tight, especially at the public institutions. As a result of varying infrastructures and resources, enrichment program structures and resources differ by campus.

Implementation and challenges. One major challenge that the NCTFP program has faced is the quick turnaround between its development and implementation. In August 2017, the NCTFP Commission was established, the committee charged with overseeing the program and selecting applicants (UNC System, 2017). The list of eligible STEM and special education licensure areas was next developed the following month in October 2017, with the five partner institutions selected November 16, 2017 (UNC System, 2017). Program applications for prospective Fellows first became available on December 31, 2017, with applications due January 16, 2018 (Hall, 2018; UNC System, 2017). Fellows were notified of their selection April 1, 2018 (UNC System, 2017). Thus, with just two months between the announcement of partner institutions and the deadline for Fellows' applications, the quick timeline left partner institutions limited time to hire staff, to recruit interested and qualified candidates to the program and to their campuses, and to develop programming and other resources for the program's first year.

As an example of the effects of the quick deadline, despite the availability for 130 Teaching Fellows across the state, only 110 Fellows were officially selected for the program's inaugural year, with the program receiving 232 total applications (Barkley, 2018). Although 110 were admitted, only 74 Fellows are participating across the five campuses in the 2018-2019 academic year (UNC System, 2019). The disparity between the number of students who were admitted and the number who chose to participate may be explained by reasons such as admitted students' decisions to attend college at other institutions (or, perhaps not at all), students not being admitted to their partnering institution(s) of choice, or students' changing interests in major or careers, among potential other reasons. While there is no commitment by the state to expand the program at this time, a report by the Joint Legislative Education Oversight

Committee to the state's General Assembly hints at this idea: "The Committee strongly supports the North Carolina Teaching Fellows Program and looks forward to the full implementation of the Program" (JLEOC, 2018). Further, NCTFP expansion has been recently listed as a priority of the state's current governor, the Board of Governors, and politicians across party lines (Fofaria, 2019; Hinchcliffe, 2019b).

Career Development and Decisions

Applicants to the North Carolina Teaching Fellows Program commit to teaching careers before they begin teacher preparation programs. By enrolling, Fellows commit to entering eligible academic programs, completing these programs, securing employment at public schools in eligible positions after their college graduation, and staying in these positions (or other eligible teaching roles) for at least as many years as they received grant funding if they enter a low-performing school, doubling this period if not. Thus, program terms beg the question, when and how do NCTFP participants choose to pursue eligible teaching careers?

College students and careers. Research has identified a number of factors that influence college student career choice, with decisions complex and highly individualized (Brown, 2004). Career decisions may be influenced by a wide range of factors, including personal interest, personality, abilities, perceived career responsibilities, anticipated salary, risk aversion, demographic characteristics, family, and environmental contexts (Arcidiacono, 2004; Beffy, Fougere, & Maurel, 2012; Binder, Davis, & Bloom, 2016; De Paola & Gioia, 2012; Porter & Umbach, 2006; Ruder & Van Noy, 2017; Wiswall & Zafar, 2015). Additionally, collegiate experiences and factors such as institutional type, academic major, experiences, and performance can play formative roles in undergraduate students' self-efficacy, expectations, and goals related to professional aspirations and career decisions (Astorne-Figari & Speer, 2019; Brown, 2004; Lent et al., 2000, 2002; Lichtenstein et al., 2009; Ro, 2011; Smith & Gayles, 2017).

In short, students tend to pursue careers with responsibilities and goals that align with their self-knowledge, including their values, interests, and talents (Diekman & Benson-Greenwald, 2018; Lent et al., 2000, 2002; Sampson et al., 2004). Research suggests that interests, personality, and perceived occupational fit tend to play an even stronger role in major and career decision-making than financial factors and other extrinsic job characteristics, although these variables do often weigh into decision processes (Brown, 2004; Carduner, Padak, & Reynolds, 2011; Diekman & Benson-Greenwald, 2018; Krumboltz, Mitchell, & Jones, 1976; Lent et al., 1994, 2000, 2002; Ma, 2009; Porter & Umbach, 2006; Sampson et al., 2004; Smith & Gayles, 2017, 2018). Thus, despite evidence that some majors and fields tend to lead to more lucrative careers than others, many students still opt to study majors and enter careers that do not produce the highest level of economic return (Arcidiacono et al., 2012; Astorne-Figari & Speer, 2019; Beggs et al., 2008; Lent et al., 1994, 2000, 2002; Sampson et al., 2004).

At the same time, financial variables are often weighed into major and career choices, even when students' estimations of these figures are incorrect (Arcidiacono et al., 2012; Ruder & Van Noy, 2017; Wiswall & Zafar, 2015). Expected earnings may be particularly relevant for students making decisions about preparing for teaching careers based on the relatively low financial return on education majors in comparison to other subjects (Carnevale et al., 2015). For example, Marder et al. (2017) found that undergraduate students in STEM majors identified low salary as the primary deterrent from pursuing teaching careers. However, students in the same study underestimated teacher salaries. When asked to provide salaries that would compel them towards pursuing teaching careers, students often provided lower figures than actual teacher salary averages, suggesting the possibility of more STEM students considering teaching careers with more accurate information (Marder et al., 2017).

Choosing teaching. Due to the overwhelming number of career options available and resulting cognitive burden, students may also rely on simplification strategies in their major and career decisions, choosing options based on exposure and occupational knowledge (Beggs, Banthan, & Taylor, 2008; Castleman et al., 2015; Marder et al., 2017; Sampson et al., 2004). Teaching is one career option that may be especially unique in its salience; many students know teaching careers exist based on their own K-12 experiences (Nias, 1987). Thus, the decision to enter teaching may be attributed in part to students' own educational experiences (Bianco et al., 2011; Lent et al., 1994; 2002; Sampson et al., 2004). Perhaps it is unsurprising that some students in teacher programs report developing interests in teaching at early ages. Some students describe that they have "always" held an interest in the career, with others identifying teaching interests while in elementary or middle school (Mamlin & Diliberto, 2015). Still other students may identify these interests later, as undergraduate students or even beyond (Mamlin & Diliberto, 2015). Given this evidence, the development of interests in teaching may also depend on the quality and nature of one's experience with their own teachers. For example, a study of Black male students at one high school found that participants tended not to see teaching as a respected career and often did not see themselves in these roles (Bianco et al., 2011). However, participants with teachers who shared their demographic identities were more likely to envision themselves in teaching roles (Bianco et al., 2011).

Beyond personal experiences, both intrinsic and extrinsic factors may help compel individuals to enter the teaching profession. Some researchers also include altruistic motivations (e.g., the desire to serve society) as a third category (Guarino et al., 2006; Jordan, 2017; Thomson, Turner, & Nietfeld, 2012) although there is debate as to whether altruism is akin to intrinsic motivation (Fike, 2016). Working with children, sharing knowledge, and contributing to society may represent sources of intrinsic motivation while sources of extrinsic motivation

include compensation, job security, and work schedules. While these extrinsic factors are not necessarily unique to teaching, the interconnectedness between the extrinsic and intrinsic factors in teaching careers may shape people's interests in these options (Day, 2006; Fike, 2016). Jordan (2017), for instance, finds that while teachers may be primarily driven to these careers by altruistic motivations, personal identity and structural constraints can have important effects on job behaviors and decisions.

The development of interests in teaching may also vary by subject area. In their study of special education teacher candidates, Mamlin and Diliberto (2015) found that students may be uniquely motivated to teach special education based on prior experiences with people with disabilities. Among students in STEM college majors and minors interested in teaching, the opportunity to mentor students, work with kids, and job conditions such as autonomy were identified as the most appealing aspects of the profession (Marder et al., 2017). Similarly, in a qualitative examination of science teachers, LiVecchi (2017) found that while teachers expressed diverse motivations for entering the profession, the relationships teachers built with students were their primary reason for staying.

When comparing STEM majors who entered teaching jobs with those who entered other career paths, Marder et al. (2017) found that teachers were significantly more satisfied with their ability to make a difference in others' lives and in their job security, although they were less satisfied with their job prestige, salary, and opportunities for upward advancement. Overall, the lack of agentic opportunities such as autonomy, upward mobility, and financial rewards tends to serve as a deterrent for choosing teaching (Diekman & Benson-Greenwald, 2018), especially as the teaching profession has seen an increase in accountability and testing standards in recent decades, further constraining autonomy (Fike, 2016). While some of these motivations and preferences may be consistent across subject areas, some differences, especially in comparing

STEM and special education, help to inform my decision to focus exclusively on NCTFP participants in STEM education programs for this study.

Overall, research that investigates the career decisions of students in teacher preparation programs and professionals who enter teaching positions concludes that motivations to enter the profession, stay within it, and/or movement to different positions are unique and varied (Barnatt et al., 2017; Donaldson & Johnson, 2011; Heineke, Mazza, & Tichnor-Wagner, 2014; LiVecchi 2017; Mamlin & Diliberto, 2015; Struyven & Vanthournout, 2014). Working conditions, including social and cultural school environments, can also be impactful to teachers' ongoing career development, identities, and motivations (Beijaard, 2000; Borman & Dowling, 2008; Struyven & Vanthournout, 2014).

Staying in teaching. Beyond entry into the teaching profession, literature on teacher career paths also pays close attention to retention in the field, as well as retention in particular types of teaching jobs. About 8% of teachers leave the profession every year (Keigher, 2010), with attrition rates especially high among teachers who are new to the profession (Guarino et al., 2006; Gray & Taie, 2015; Keigher, 2010; Schaefer, Long, & Clandinin, 2012). In their meta-analysis on teacher attrition and retention, Borman and Dowling (2008) identified five categories of variables that affect teacher attrition: teacher demographic characteristics, teacher qualifications, school organizational characteristics, school resources, and the characteristics of students within a teacher's school.

In terms of teacher demographics, gender, race, and age are the primary variables studied when considering teacher retention. Women are more likely to leave the field (Borman & Dowling, 2008; Keigher & Cross, 2010), a difference that may be attributed in part to parental leave (Lindqvist et al., 2014). Race also serves as a predictor of retention, although its results are mixed across studies and contexts. While some research has found that White teachers are more

likely to leave the career than teachers of other races (Borman & Dowling, 2008; Guarino et al., 2006), others find Black teachers leave at profession at higher rates (Carver-Thomas & Darling-Hammond, 2017; Keigher & Cross, 2010). When considering teacher age, research suggests a U-shape pattern with attrition, greater attrition among teachers who have been in the profession for the shortest and longest terms (Borman & Dowling, 2008; Carver-Thomas & Darling-Hammond, 2017; Ingersoll, 2001; Keigher & Cross, 2010). This pattern of early leaving may be explained in part by principles of human capital theory (Becker, 1994); teachers who have less time and experience invested in the career may be more inclined to leave. The same idea applies to research that finds a positive relationship between teacher credentials and retention: certification and graduate degree are positively associated with retention (Borman & Dowling, 2008).

Among school characteristics, there is close alignment between schools that have difficulty recruiting teachers and those that have difficulty retaining teachers. Schools with high turnover rates tend to have more limited financial resources, with directly negative implications for instructional spending, teacher salaries, administrative support of teachers, teacher workload and time for collaboration, and input and decision-making power for teachers (Borman & Dowling, 2008; Feng, 2009; Guarino et al., 2006; Simon & Johnson, 2015; Staklis & Henke, 2013; Struyven & Vanthournout, 2014; Sutcher et al., 2016). Further, these schools also often have high enrollments of low-income and minority students, lower student test scores, and greater challenges with student behavior and discipline (Allensworth, Ponisciak, & Mazzeo, 2009; Simon & Johnson, 2015; Marinell & Coca, 2013). Simon and Johnson (2015) clarify that while low-income and high-racially minoritized student body characteristics predict teacher attrition, this relationship is a function of the working conditions and limited resources at schools that tend to serve students of these demographics rather than the characteristics of the students themselves.

Research on teacher attrition and retention suggests that while some teachers may leave the career based on personal circumstances, school environments and satisfaction can also influence longevity. Worryingly, a dissertation study of the original North Carolina Teaching Fellows found relatively low job satisfaction among Fellows, especially in their first four years, the period of required service for loan forgiveness (Denning, 2008). According to Denning (2008), Fellows were less satisfied than their peer teachers in North Carolina on all measures of working conditions, although as working conditions improved, job satisfaction did as well. Overall, the Fellows who were more satisfied with teaching were more likely to stay in their career beyond their required service (Denning, 2008). Thus, even when intrinsic or altruistic motivations may inspire students to pursue careers in teaching, extrinsic conditions may shape career development, interests, and goals along the way (Fike, 2016), with satisfaction directly connected to retention (Kelly & Northrup, 2015). Career development is a lifelong process and continues to evolve for students and teachers throughout the course of one's education, student teaching experiences, and experiences in professional roles (Liou & Lawrenz, 2010).

An Example: Teach for America

In the absence of research on the new North Carolina Teaching Fellows program and similarly-structured loan forgiveness programs, research on a better-studied teacher recruitment program, Teach for America (TFA), provides interesting insight into career behaviors and retention in teaching. TFA and the NCTFP share a focus on recruiting academically talented students who might not have otherwise considered teaching into the career, both also requiring finite service commitments. To clarify, there are substantial differences between the programs in other dimensions. TFA is not a loan forgiveness program, recruits teachers from all fields—most of whom have *not* completed teacher preparation degree programs, at least at the time of recruitment—and assigns its members to high-needs environments. By contrast, the NCTFP is

built on state needs, participants attend specific academic programs and institutions and receive professional development and enrichment opportunities throughout their enrollment, and graduates have autonomy in their post-graduate job decisions, although they must stay in state at public schools. However, research on TFA offers insight into the ways in which students may approach teacher recruitment programs that have pre-established service requirements.

Research on TFA generally finds that it achieves its goal in recruiting academically talented students into the teaching profession, especially students from highly selective institutions, placing these students into high-needs schools (Decker, Mayer, & Glazerman, 2004). These recruitment and placement outcomes are evident in North Carolina as well; TFA members are more likely to enter teaching roles in low-performing schools, as well as schools with higher proportions of racially minoritized students and low-income students than teachers who enter the profession from other entry points (Bastian & Xing, 2016). TFA is subject to greater controversy, however, in the retention of its recruits within the teaching profession. Some argue that TFA contributes detrimentally to the “revolving door effect” (Ingersoll, 2004) of high teacher turnover rates in high-needs schools (Decker et al., 2004).

One study on TFA members in an urban region categorized participants into leavers, lingerers, and lasters in regard to the teaching profession (Heineke, Mazza, & Tichnor-Wagner, 2014). Leavers were TFA teachers who left the profession immediately after their two years of service. Leavers tended to recognize challenges in the American education system without viewing themselves as part of the solution, instead demonstrating a higher commitment to personal professional goals (Heineke et al., 2014). This trend is consistent with another study that examined TFA members’ motivations for entering teaching, where more than half of respondents (56.6%) reporting that they joined the program with the intention of participating for only two years (Donaldson, & Johnson, 2011). Both studies found that students who participated

in TFA as a short-term commitment tended to do so en route to other professional and academic goals, the most common of which was graduate school. Some students even applied to and deferred entry into graduate school prior to partaking in TFA (Donaldson & Johnson, 2011).

Heineke et al.'s (2014) lingerers stayed in teaching for three years, just beyond the two required years of the TFA commitment. TFA members in this category tended to see their teaching as an opportunity for personal growth and the experience often led to change in future career goals. Lingerers in the study were committed to the TFA mission but not necessarily to teaching, and these participants commonly entered other roles in education after teaching.

According to Donaldson and Johnson's (2011) study, 43.3% of TFA members enter the program with intentions of staying longer than the program's required two years, including 11.3% who planned to stay in teaching through full careers. Heineke et al. (2014) categorized TFA members who stayed in teaching long-term as lasters, a category of participants who tended to identify more with teaching than with TFA itself. While more than half of TFA members left their initial placements in low-income schools after their required two years, 15% stayed in their schools for at least five years (Donaldson, & Johnson, 2011). Although motivations for the leavers may be predominantly attributed to existing career goals outside of teaching, participants who stayed at their schools beyond the required service were more likely to report positive experiences in these environments (Heineke et al., 2014), which is consistent with Denning's (2008) findings on original NCTFP members. Findings also suggest that those with an early commitment to teaching stayed in the profession longer (Donaldson & Johnson, 2011).

While recruitment programs like TFA may provide a path into teaching for some students with existing interests and commitments to the profession, over half of TFA corps members leave the profession after two years, with 80% leaving after three years (Helig & Jez, 2010). Research on the effectiveness of TFA teachers mirrors other research on teacher preparation that

shows that the more preparation received, the more effective the teacher, at least in the beginning of the career (Clotfelter, Ladd, Vigdor, 2010; Ladd, 2008). Certified TFA teachers are more effective than uncertified TFA teachers, and uncertified TFA teachers are about as effective as other uncertified teachers (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005). In general, researchers agree that teachers who enter the profession through traditional educator degree programs are better prepared for teaching work, are generally more effective teachers, and are more committed to the profession and more likely to stay than TFA-recruited teachers without these credentials (Darling-Hammond et al. 2005; Decker et al., 2004; Helig, & Jez, 2010; Laczko-Kerr & Berliner, 2002). Although the TFA program differs from the NCTFP in many ways, findings related to motivation and longevity after finite service commitments could help to provide insight into NCTFP participation and retention as well.

Theoretical Frameworks

The present study is guided by two overarching theoretical perspectives: social cognitive career theory (SCCT; Lent et al., 1994 2002) and concepts from behavioral economics that extend rational choice theory to integrate psychology and economics principles to explain choice-making behavior (Camerer, 2014; Mullainathan & Thaler, 2001; Weimer, 2017). While often referred to as by singular term, “behavioral economics” is not just one concept but rather a set of theories used to understand why people behave in ways that are not strictly rational. I draw several constructs from behavioral economics for the present study to represent decision making processes, including the ideas of limited information, cognitive burden, framing effects, and time-inconsistent preferences (Camerer & Loewenstein, 2004; Castleman et al., 2015; DellaVigna, 2009; Jabbar, 2011; Kahneman, 2003; Mullainathan & Thaler, 2001; Robinson, 2016; Tversky & Kahneman, 1981).

SCCT and behavioral economics perspectives serve different purposes in this study, working in tandem to explain participants' career development and decision processes, respectively. SCCT provides insight into Fellows' long-term career development, identifying key experiences that have shaped Fellows' interests and self-efficacy related to STEM teaching careers. Although SCCT acknowledges the role of external factors on learning experiences and career interests, goals, and behaviors, the model lacks nuance regarding the consideration and weighing of contextual factors in decision making. Behavioral economics principles extend SCCT by providing a framework for analyzing Fellows' NCTFP participation decisions and their resulting commitments towards entering teaching careers in secondary STEM education at public institutions in North Carolina. Both SCCT and behavioral economics frameworks inform interview protocol, data analysis, and interpretation.

Social cognitive career theory. SCCT is a derivative of Bandura's (1986) social cognitive theory, which identifies internal and external factors that contribute to human behavior. Two career perspectives that build on Bandura's work—Krumboltz's social learning theory of career decision-making (Krumboltz, Mitchell, & Jones, 1976) and self-efficacy within students' career development (Betz & Hackett, 1981)—further inform SCCT. Krumboltz et al. (1976) posit that career decisions are based on a “complex interaction of genetic components, environmental events and conditions, and learning experiences,” as well as by “social forces which affect occupational availability and requirements” (p. 80). While Krumboltz et al. (1976) focus on the role of learning experiences, information, people, and situations in career decisions, concepts of self-efficacy are largely absent from the model (Lent et al., 1994). SCCT builds upon Krumboltz et al.'s work to incorporate a cognitive constructivist view, acknowledging the importance of social cognition in career development, particularly one's appraisal of their own

performance and environments (Lent et al., 1994). Ultimately, SCCT was created to converge and extend related concepts from existing career theories (Lent et al., 1994). The use of the term “career” in SCCT, and in the present study, refers to interest and choice processes related to both academic and career behaviors. Lent et al. (1994, 2002) explain that academic choice and career choice are not only similar in nature and implications, but that academic decisions often intersect with, and lead directly to, career selections.

Three primary social cognitive mechanisms of SCCT are self-efficacy, outcome expectations, and goals (Lent et al., 1994; 2002). *Self-efficacy* represents a person’s dynamic assessment of their own capabilities related to a certain type of performance, based on both skill and one’s ability to employ skill (Bandura, 1986). *Outcome expectations* include the imagined results of taking on a task, including both extrinsic and intrinsic outcomes such as rewards and self-approval (Lent et al, 1994, 2002). Finally, *goals* represent a person’s “determination to engage in a particular activity or to effect a particular future outcome” (Lent et al., 2002, p. 263). Goals are self-motivating, helping people to organize and sustain certain behaviors in the interest of future accomplishments. Together, these three reciprocal concepts represent social cognitive behaviors that are critical to career development and decisions.

Within the SCCT model, self-efficacy and outcome expectations hold a direct influence on career interests, with self-efficacy also contributing to the development of outcome expectations. Successful task performance can lead to self-efficacy and positive outcome expectations, or a belief in one’s own present and future competence. Due to the desire for positive outcomes, people tend to form interests related to their competencies, also generally failing to develop interest in tasks in which they do not believe they will be successful (Bandura, 1986, 1994, 1997; Lent et al., 1994, 2002). Interests then promote goal-setting behavior; people

seek to sustain and increase involvement in the tasks associated with self-efficacy and positive outcome expectations (Lent et al., 1994, 2002).

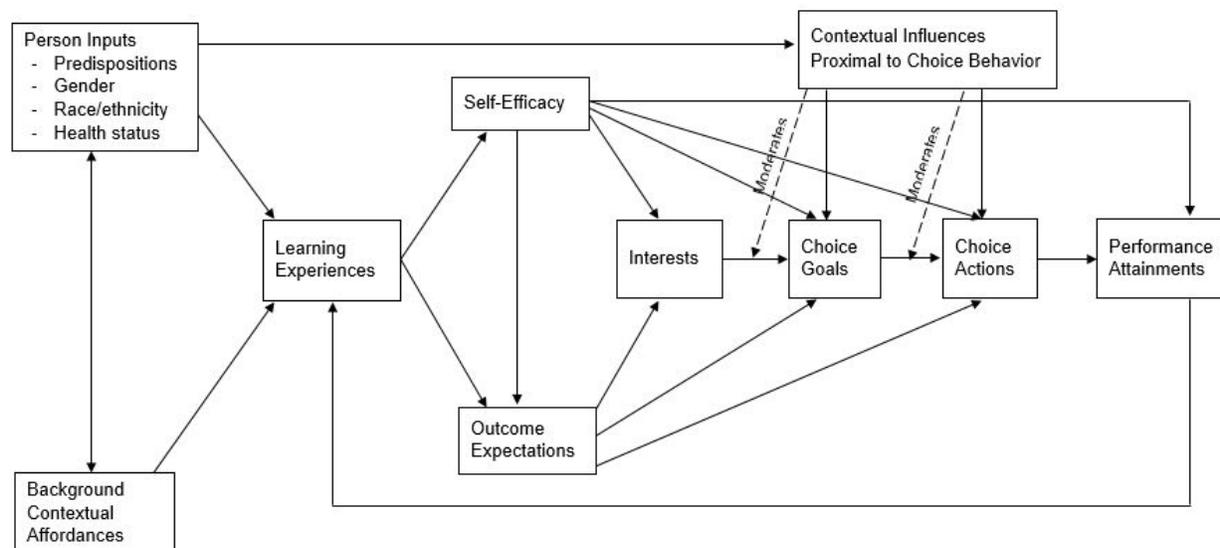


Figure 2.1. Social cognitive career theory. Adapted from Lent, R. W., Brown, S. D., & Hackett, G. (2002). Social cognitive career theory. In D. Brown (Eds.) *Career Choice and Development* (pp. 255-311). New York, NY: Jossey-Bass.

Contextual influences are also located proximal to choice behaviors in the SCCT model, directly influencing the relationship between an individual's interest and goals, and/or an individual's goals and actions (Lent et al., 1994). Proximal influences represent the presence or absence of barriers and deterring/favorable conditions that are salient at a particular juncture of decision making, such as the availability of jobs in one's field or financial support for a certain option (Lent et al., 2002). With the perception of few barriers and positive environmental conditions, the relationships between interests and goals, and between goals and actions, is strong. Conversely, less favorable conditions will weaken these relationships. For example, a student who holds an interest in teaching may establish a different career goal if they perceive contextual barriers like a lack of available teaching jobs, or an anticipated low salary when financial needs are high, to inhibit their access to teaching and/or their success in the job.

Self-efficacy. Due to the importance of self-efficacy in the development of career interests in the SCCT model, this paper focuses predominantly on this construct when investigating the development of career interests among future teachers. Self-efficacy is developed from four primary sources: personal performance and accomplishments, vicarious learning, social persuasion, and physiological and affective states (Bandura, 1994, 1997; Lent et al., 2002). One's own successful performance is the strongest source of self-efficacy, an indicator of capability: "the most authentic evidence of whether one can muster whatever it takes to succeed" (Bandura, 1997, p. 80). Success in certain tasks builds confidence in one's capabilities, just as failure, especially if experienced continuously, undermines self-efficacy. However, easily obtained success can lead to quick discouragement in the face of failure and, as a result, successful performance earned through perseverance and resiliency is especially important to building self-efficacy (Bandura, 1994, 1997; Lent et al., 1994, 2002).

The second source of self-efficacy is vicarious learning, where people assess their own capabilities by observing the attainments of others and comparing themselves to these social models. If a person perceived to be similar to oneself is successful in a certain domain, an individual is likely to predict their own success in this domain as well. The role of vicarious learning on a person's self-efficacy may be especially impactful when an individual has limited personal experience upon which to assess their own capabilities (Bandura, 1997).

The third source of self-efficacy, social persuasion, refers to the role of social influence and verbal persuasion that one holds certain abilities. Because social persuasion comes from others and may be subjective, it is not a strong source of sustainable self-efficacy by itself, especially if there is a discrepancy between performance and feedback. However, persuasion can be especially useful to mobilizing effort and behaviors that contribute to self-efficacy (Bandura, 1997). Just as social persuasion that one holds certain capabilities can promote self-efficacy,

feedback that one does not hold capabilities for a certain domain can weaken self-efficacy. The impact of social persuasion is also dependent on the source; persuasion from individuals perceived to be credible is stronger, as is persuasion that is seen as more realistic, or “moderately beyond” what participants can do at the time (Bandura, 1997, p. 105).

The final source of self-efficacy is physiological and affective states (Bandura, 1994, 1997; Lent et al., 1994, 2002). In assessing one’s own skills, people rely in part on somatic information conveyed by cognitive and physical states related to certain tasks. Activities associated with negative physiological or affective experiences, such as stress or pain, can detract from self-efficacy while tasks that are associated with positive feelings, including a positive mood, serve as a source of self-efficacy (Bandura, 1997). Mood can also mitigate performance appraisals; those who fail while in a positive mood may overestimate their capabilities, while those who succeed in a negative mood may have the reverse experience (Bandura, 1997). Thus, one’s physical and cognitive reactions to certain tasks and learning experiences can influence their perceived capability in these domains, thus influencing self-efficacy (Bandura, 1994, 1997; Lent et al., 1994, 2002).

In sum, SCCT is a model that focuses on career and academic interest development, choice, and performance (Lent et al., 1994, 2002). The model incorporates principles from existing social cognitive and career theories, emphasizing the role of experiences on beliefs about the self, with implications for career interests, goals, and behaviors. Consistent with narrative inquiry methodology, SCCT centers the life experiences of an individual and the individual’s interpretation of events (Lent et al., 2002). The developmental nature of SCCT, especially the construct of self-efficacy as it relates to outcome expectations and career interests, is used to frame the growth and evolution of Fellows’ interests in teaching careers in secondary

STEM education over their life course, positioning the NCTFP as a proximal contextual influence with implications for participants' career goals and behaviors.

Behavioral economics and bounded rationality. While SCCT is useful for understanding the development of career interests, goals, and behaviors, the model falls short in analyzing the decision processes critical to students' ultimate choices related to specific opportunities. The model broadly incorporates contextual influences on the formation of job goals and attainments (e.g., acknowledging the role of job availability in a certain field or location, cost of living, etc.), but does not assess or discuss the weight of various factors related to one's career decisions. Thus, I use concepts from behavioral economics to frame complex decision-making processes central to the present study.

Traditionally, economic theories are based on the principle of rational choice, that decision-makers consider their options by way of a cost-benefit analysis, selecting the option that maximizes the benefits relative to costs, resulting in well-informed, rational, and self-interested decisions (Becker, 1994; Robinson, 2016). This perspective assumes that people have all necessary information when making a decision, that they fully understand information despite any complexities, and they are able to accurately and rationally analyze information to make a choice that optimizes benefits while minimizing costs. Further, while judgments are subjective and based on one's own view and definition of their personal wellbeing, these same judgments are also assumed to be based on coherent and stable preferences, invariant over time (Bernheim, 2016; Castleman et al., 2015). However, while the theory of rational choice may offer insights into decision making, it fails short in fully explaining behavior that does not reflect these principles (Bernheim, 2016; Tversky & Kahneman, 1986; Weimer, 2017). Instead, people often demonstrate bounded rationality in decision making.

As behavioral economics theorists point out, rational choice is psychologically and behaviorally unrealistic (Castleman et al., 2015; Kahneman, 2003; Weimer, 2017) and behavioral deviations from the rational choice model are “too widespread to be ignored, too systemic to be dismissed as random error” (Tversky & Kahneman, 1986, p. 3). Instead, people operate under a bounded rationality where decisions do not necessarily reflect a person’s best interests long-term (Mullainthan & Thaler, 2001; Robinson, 2016). Bounded rationality is a broad concept that includes systematic biases that differentiate people’s decisions from optimal decisions based on rational-agent models (Kahneman, 2003). These deviations from rational choice are systematic and predictable, with behavioral economics offering insight into the nature and form of these biases (Weimer, 2017). Decisions may be particularly difficult (and irrational) when choices are complex, when people have limited experience, when information is framed in certain ways, and when costs and benefits occur over different time frames (Scott-Clayton, 2015). Given the highly complex nature of decisions related to postsecondary education and careers, the relative professional inexperience of traditional age college students, and the longitudinal implications of decisions associated with college attendance, concepts of bounded rationality are especially fitting to the situations and decisions of students (Scott-Clayton, 2015).

Scholars have processed the implications of behavioral economics concepts on rational choice theory differentially (Weimer, 2017). While some scholars may be inclined to use behavioral economics to discount traditional theoretical approaches, Weimer (2017) endorses the use of behavioral economics *alongside* neoclassic cost-benefit analysis to identify the behavioral challenges of particular contexts on a case-by-case basis. I use this approach in the present study, analyzing participants’ perceived costs and benefits related to NCTFP participation while also acknowledging evidence of bounded rationality in decision making. Three types of bounded

rationality are used to frame participant decisions in the present study: limitations associated with information access and processing, framing effects, and time-inconsistent preferences.

Information access and processing. While traditional economics theory assumes well-formulated preferences and rational decision making, behavioral economics acknowledges that humans are imperfect and may not have all information or may not adequately process the information they do have in order to make optimal decisions. A lack of information impedes a person's ability to access certain resources, since, in many cases, a person must know about a resource in order to access it. Despite the availability of teacher support programs at federal, state, and local levels (Appendix A; AFT, n.d.; Clewell & Forcier, 2001; Kolbe & Strunk 2012) knowledge of these programs is generally low. Nationally, only 32% of 2008 college graduates who were considering teaching, had prepared to teach, or who had taught indicated that they were aware of loan forgiveness programs and only 14% were aware of the TEACH Grant program (Skomsvold, Durand, & Henke, 2012). By 2012, figures from the same Baccalaureate and Beyond study still reflected a lack of information; 55% of graduates of education programs reported knowing about teacher loan forgiveness programs (NCES, n.d.-a). Participation in these programs is similarly low; even among 2009 graduates in teaching who knew about loan forgiveness programs, only 7% participated in them (NCES, n.d.-a).

Part of the limited knowledge may be attributed to the complexity of these programs. Even if students and families are aware of financial aid available for college attendance, the inconvenience and complexity of the application process can deter students from applying (Dynarski & Scott-Clayton, 2006). Often, complex information and processes can lead to cognitive burden, sometimes impeding action altogether, or leading to decisions based on simplifying strategies heavily reliant on intuition and/or the most accessible information

(Castleman et al., 2015; Kahneman, 2003). Thus, decisions based on limited information may overlook or exclude information critical to a rational cost-benefit evaluation. Research on college students navigating bureaucratic processes finds that, even in the face of acknowledging shortcomings to their own understanding of options, students don't necessarily seek out information to fill these gaps but may instead rely on anecdotal and idiosyncratic information already available, approaching decisions as somewhat of a trial and error process rather than collecting information to conduct a rational cost-benefit analysis before making commitments (Beggs et al., 2008; Scott-Clayton, 2015).

Instead of objectively evaluating all options, people may further rely on simplification strategies in decision making, especially when information is complex and overwhelming, leading to cognitive overload. This burden is especially likely when comparing options that differ based on varying dimensions, a common situation for postsecondary decisions that require assessing academic and financial options simultaneously often alongside other factors (Scott-Clayton, 2015). Students choosing colleges are unlikely to find themselves evaluating multiple institutions equal in all dimensions except price, for instance, as these institutions are also likely to differ in location, size, selectivity, academic offerings, and more. Relying on easily accessible information and cues, such as a marketing brochure or the anecdotal account of a personal connection can help to simplify these decisions and lead to action, even if not fully rational. Such simplification strategies can be both useful and harmful, providing quick answers when capabilities are limited and/or when information is complex, but can also lead to errors (Camerer & Loewenstein, 2004).

Framing effects. In addition to a person's limited ability to process all information in decision making, rational choice can also be influenced by the way in which information is

presented. Even if all information communicated is factually accurate and objectively equivalent, the presentation of information can influence a person's perception of it, and resulting decisions. Scott-Clayton (2015) posits that students may be especially dependent on how information is structured and marketed in postsecondary decisions given their relative inexperience and likely cognitive burden.

Framing effects are well-cited across behavioral economics literature and Tversky and Kahneman's (1981) disease problem serves as a common premise to illustrate the concept. In this situation, a decision-maker may be asked to choose between one of two positive frame options: (a) saving 200 lives for certain, or (b) a one-third chance of saving all 600 and a two-thirds chance of saving no one. The decision maker must also choose between two negative frame options: (c) 400 people dying for sure, or (d) a two-thirds chance of 600 people dying and a one-third chance of no one dying. Based on framing effects, people are likely to choose option a over option b, and option d over c, preferring the positive frame of lives saved over the negative frame of lives lost, even if the two options are factually equivalent (Camerer & Loewenstein, 2004; Levin et al., 1998; Tversky & Kahneman, 1981). Thus, the way in which information is presented, emphasizing positive or negative aspects, can have important implications on an individual's choice-making behavior.

Beyond highlighting positive or negative features or outcomes, framing effects also apply to situations where certain elements of risk are described differently (as in the example above), or where some characteristic or goal of the object or program of focus is emphasized (Levin, Schneider, & Gaeth, 1998). Framing effects relate closely to the very foundation of marketing tactics and strategies, where the presentation of the same information can result in differential consumer behavior (Bertrand et al., 2005). As an example, one proposed solution to addressing

relatively low borrower participation in income-contingent repayment plans is to change the name of the program to an alternative that offers simpler language and that emphasizes the benefits of participation. Boatman et al. (2014) suggest that the policy be renamed “pay as you earn,” or, to better emphasize benefits: “pay as you earn and protect your credit.”

In higher education, one experimental study found that the ways in which information about the Free Application for Federal Student Aid (FAFSA) is communicated to low-income consumers can influence their likelihood of applying (Bettinger et al., 2012). Although information about the FAFSA and the form itself are publicly available and free, the complexity of the form can serve as a substantial obstacle, even among those who know about it (Dynarski & Scott-Clayton, 2006). Bettinger et al. (2012) found that providing information about the form to consumers increased applications, but that coupling information interventions with individualized assistance led to an even greater likelihood of completing the FAFSA (Bettinger et al., 2012). Another study found that providing prospective college students information about college admissions options, including a way to compare their academic profile to similar applicants, can influence application behaviors and choice (Mulhern, 2019). Like with Bettinger et al., this resource was especially effective for those who had otherwise limited information about the college admissions process (Mulhern, 2019). In both studies, the students’ likelihood of receiving financial aid or getting into a particular college was no different than it would have been without the interventions, the only change was only the presentation of the information and support about the FAFSA or college admissions processes, which did impact behavior.

In general, policies framed to reduce cognitive and/or behavioral costs upfront are more attractive to consumers. Easily communicated financial aid programs are shown to have a “robust impact on college entry and completion” (Dynarski & Scott-Clayton, 2006, p. 2; Dynarski, Libassi, Michelmore, & Owen, 2018) while programs that require FAFSA completion

show less of a positive impact due to the proximal costs of completing these complex processes. Framing programs to frontload benefits can similarly increase program attractiveness among prospective consumers. One study found that student loan subsidies were more likely to serve as an effective financial incentive when loans were given at the time of enrollment instead of relieved after graduation, even if the financial benefits were equivalent (Gandhi, 2008). Similarly, an experiment at a law school found that students were more likely to pursue public interest law when they received funding to do so upfront (committing to post-graduate service after), rather than receiving retroactive loan forgiveness (Field, 2009). Not only do these studies reveal the criticality of framing effects among economically equivalent options in provoking differential behavior, they also illustrate time-inconsistent preferences.

Time-inconsistent preferences. The third category of behavioral deviations from rational choice used to frame the present study is time-inconsistent preferences, or present bias. While traditional economics theories assume the stability of preferences over time, behavioral economics research reveals that decision-makers have different preferences at different points in time (DellaVigna, 2009). There is a disconnect between people's experience of their future goals and the upfront costs required for achieving such goals (Castleman, 2015). Research related to decision-making finds that people are myopic, biased towards the present and often unwilling to incur short-term costs even if costs represent an investment toward greater benefits in the future. In general, people tend to be unaware of their future self's lack of self-control (Baum & Schwartz, 2015; Camerer, 2014). DellaVigna (2009) uses the example of living a healthier life: people often make distal plans to lose weight but the short-term costs of exercising or eating healthier foods seem higher when the future becomes the present. This bias can be both economic and affective. Although people tend to make decisions based on what they believe will

make them happiest, people have a tendency to inaccurately predict how different actions will make them feel, sometimes leading to suboptimal decisions and actions (Fudenberg, 2006).

This timing mismatch has innumerable applications to higher education. Enrollment in higher education requires significant upfront financial and opportunity costs while financial benefits are typically realized only after completion (Dynarski & Kreisman, 2013). This can, again, be illustrated by college and financial aid application behaviors: a student may have decided that they want to go to college but when the time comes to apply to the college and to apply for financial aid, the immediate costs of doing so may seem burdensome, the benefits too distal to motivate present behavior (Baum & Schwartz, 2015). Based on the idea of a present bias, immediate costs (such as the time and effort required in applying for college or applying for financial aid) can demotivate certain behavior, even if the behavior is rational. In the same vein, students may have little difficulty committing to something costly in the future but following through on those plans can become difficult once that future arrives.

Even in contexts where all information is obtained and understood, biases can affect decision making, resulting in forecasting errors (DesJardins & Toutkoushian, 2005; Weimer, 2017). People tend to demonstrate a misperception of risk and an overconfidence in themselves. Behavioral economics research suggests that people have a “pervasive tendency to believe they are better than others in a multitude of ways and that life’s negative events are less likely to befall them than their peers” (Chambers & Windschitl, 2004, p. 813). People tend to overestimate their performance, especially for difficult tasks, and think of themselves as different (and better) than the norm, demonstrating an imperfect knowledge of their own performance and that of others as well (Moore & Healy, 2008). However, overconfidence may vary by individual

and can be influenced by exposure to difficult problems and situations (Ehrlinger, Mitchum, & Dweck, 2016; Moore & Healy, 2008).

In the context of the present study, there is a temporal mismatch between costs and benefits associated with the NCTFP. The largest benefits are received upfront in the form of financial support, while the most significant costs, loan repayment, are distal. The appeal of receiving money in college to be paid back through future service or cash may seem to be a rational choice at the time of the decision but, as the future nears, the cost of loan repayment may become greater than originally perceived. Yet, if commitments are left unfulfilled, participants incur significant financial ramifications they may not have anticipated, loans with higher interest rates than federal loans. This is particularly concerning in the context that *at least 30%* of Fellows in the original NCTFP paid the loans back in cash (Cohen, 2015; NCOSA, 2003), with figures for the similarly-structured TEACH Grant program showing far more dismal outcomes (Barkowski et al., 2018; CFPB, 2017; GAO, 2015). Further, research shows that many college students preparing for education programs will not actually enter teaching careers at all, or may choose to leave the profession shortly after entering (Borman & Dowling, 2008; Feng, 2009; Gray & Taie, 2015; Guarino et al., 2006; Horng, 2009; Simon & Johnson, 2015; Staklis & Henke, 2013; Struyven & Vanthournout, 2014; Sutchter et al., 2016).

Based on its forgivable loan structure, the NCTFP assumes that the career interests and goals of those who apply to the NCTFP will remain consistent between program entry and completion. However, the concept of time-inconsistent preferences suggests that this is unlikely. Even if joining the program is a rational decision based on the information one has access to at the time (DesJardins & Toutkoushian, 2005), people are present-biased and inherently limited in their ability to predict the interests of their future selves and the future contextual factors that will shape their later job decisions and pathways (Baum & Schwartz, 2015; DellaVigna, 2009).

CHAPTER 3: METHODOLOGY

To understand the career development, participation decisions, and post-graduate plans of North Carolina Teaching Fellows Program participants, I employ a narrative case study design (Clandinin & Connelly, 2000; Connelly & Clandinin, 1990; Gotham & Staples, 1996; Riessman, 2008; Yin, 2014) to address the following research questions:

- RQ1. What are the storied experiences of participants in the new North Carolina Teaching Fellows Program pursuing careers in secondary STEM education?
- RQ2: What are the key experiences that shaped the development of participants' interests in careers in secondary STEM education?
- RQ3: What are the perceived benefits of the NCTFP, and how do these benefits shape participants' college and career plans?
 - d. How do the benefits of the NCTFP shape participants' decisions to attend a partner institution?
 - e. How do the benefits of the NCTFP shape participants' decisions to pursue academic programs in secondary STEM education?
 - f. How do the benefits of the NCTFP shape participants' career goals related to teaching in state, teaching at low-performing schools, and plans to stay in teaching long-term?

Narrative Case Study

Narrative case study research combines two qualitative approaches, narrative inquiry and case study. Combining these two approaches offers several benefits to the present analysis.

While narrative inquiry involves an in-depth exploration and presentation of the storied experiences of individual participants, case study methods establish bounds and a strategy for examining actions and events within a specific context (Gotham & Staples, 1996). In this study,

participant narratives are the focal point of the research, understood and analyzed within a context defined not only by the program of interest, the current iteration of the North Carolina Teaching Fellows Program, but also bounded temporally and by institutional context. Context is particularly important as the analysis considers larger sociopolitical and economic trends related to the teacher workforce, both nationally and within North Carolina, and acknowledges the changing nature of the NCTFP itself. Gotham and Staples (1996) describe the heightened importance of context in combining narrative inquiry and case study approaches: “The narrative case study...provides a means for connecting specific historical events and contingent decisions to large-scale social processes as they change over time” (p. 491).

Narrative inquiry. Narrative inquiry is a qualitative research design built on the idea of humans as “storytelling organisms, who, individually and socially, lead storied lives” (Connelly & Clandinin, 1990, p. 2). Narrative inquiry is defined by its present-centered focus on one’s history and is “first and foremost a way of thinking about experience” (Connelly & Clandinin, 2006, p. 477). Narrative inquiry and analysis, then, is a method through which a researcher explores how people remember and present their experiences in a meaningful way. Notably, the concept of narrative is both a phenomenon, the experience to be studied, and a methodology, the strategy of inquiry and analysis (Connelly & Clandinin, 1990; Creswell, 2014). The narrative as a phenomenon is often referred to as a person’s *story* (Connelly & Clandinin, 1990; Gotham & Staples, 1996).

Constructivist epistemology. In the present study, I take a constructivist approach to narrative inquiry. Narrative researchers may assume a naturalist or constructivist epistemology, with the former using rich descriptions of individuals within their natural environments and the latter focused on a social construction of lived experiences and environments developed through interpersonal interaction (Esin, 2011). The aim of the constructivist epistemological approach is

to produce knowledge reflective of participants' realities through a reconstruction of understanding (Lincoln, Lynham, & Guba, 2011). In working toward this end, constructivist researchers "rely as much as possible on the participants' views of the situation being studied" (Creswell, 2014, p. 8). Constructivists also focus on the specific historical and cultural contexts of participants to seek varied and multiple meanings of certain experiences (Creswell, 2014). This process is interactive and inductive, leading to a mutual and collaborative uncovering and chronicling of participants' stories throughout the course of the research process (Clandinin & Connelly, 2000; Clandinin, 2013; Connelly & Clandinin, 1990; Creswell, 2014; Riessman, 2008).

In narrative inquiry, special focus is given to events, interruptions, and tensions that serve as critical turning points that connect participants' personal and professional lives (Creswell, 2014). Narrative inquiry is especially appropriate for understanding career development, as reflection on one's life course provides important insight into understanding different facets of identity development (Chase, 2011; Elder et al., 2003; McAdams, Josselson, & Lieblich, 2006). In narrative inquiry it is the researcher's role to organize participants' stories into a chronology and to analyze this sequence of events and experiences for key elements, a process referred to as *restorying* (Creswell, 2014). Thus, while the constructivist researcher makes meaning of the world through the lenses of others, knowledge is co-created and is ultimately shaped by the researcher's own experiences and background (Creswell, 2014).

Data used to address the research questions in the present study are biographical in nature, focusing on life course stages featuring key learning experiences that influenced Fellows' career ideas and goals. Because everyone tells stories differently and because not all narrators follow a chronological sequence (Riessman, 2008), part of the researcher's responsibility is to create a story with a "clear sequential order" (Esin, 2011, p. 93) to connect events meaningfully.

In the present, analysis, I adopt a narrative thematic approach to data collection, presentation, and analysis (Esin, 2011; Riessman, 2008), focusing on the content of what participants share rather than the specifics of how this information is told. In doing so, it is common for researchers to clean up participant language in reproduced text to better emphasize the content of the speech—the events, ideas, and perceptions noted by participants—maximizing content and meaning and making the experiences more readable (Riessman, 2008).

Life course. Narrative inquiry emphasizes a person's story, and life course is useful for instructing narrative procedure, especially in research that explores the development of experiences over time and across life stages, like the present research design. Consistent with narrative inquiry methodology, life course emphasizes the criticality of context in one's experiences and pathways, including age-graded patterns that acknowledge the importance of context in human development (Elder et al., 2003). Elder et al. (2003) provide five general principles that guide life course: (a) Life-span development, or the principle that human development and aging are lifelong processes and require a long-term perspective; (b) Agency, where individuals make their own decisions and actions based on opportunities within their circumstances; (c) The influence of historical times and place on one's life course; (d) Timing, with the consequences of events and actions varying based on the context of one's life; and (e) Linked lives, or the interdependence and shared relationships that influence the life course.

Life course recognizes that time operates both personally and within a sociohistorical context. Today's traditional-aged college students (ages 18-22) were mostly born in the final years of the twentieth century, witnessing the Great Recession and the effects of the economy's recovery throughout their secondary and postsecondary years. Students may have heard about or witnessed teacher strikes in recent months and years, including in North Carolina (Webster, 2018). Current students may also be familiar with the former North Carolina Teaching Fellows

Program that was funded until 2011, as traditional age college students would have been between the approximate ages of 10 and 14 when the original program ended. As one of the foundational goals of the original NCTFP was to elevate the perception of teaching in the state, success in achieving this end could have influenced participants' perceptions of the profession, and/or those of their families and other mentors, or may have influenced participants' interest in the renewed version of this program. The principles of life course are thus used to provide a chronology for participants' stories, further positioning their experiences, development, and decisions within larger sociological and historic contexts.

Case study. This narrative case study focuses on the experiences of 10 participants in the 2018-2019 NCTFP who are preparing for teaching careers in secondary STEM education. Although the stories of participants are at the center of this research, the in-depth description and analysis of a "contemporary phenomenon...within a real-world context" (Yin, 2014, p. 16) is bounded both spatially and temporarily; defined by participants who are involved in the inaugural year of the NCTFP in STEM education programs. Combining narrative inquiry and case study methods, I therefore employ narrative inquiry strategies within the specific, unique, and bounded case (Yin, 2014) of the 2018-2019 North Carolina Teaching Fellows Program. This methodological strategy is used to explore these experiences in-depth, including through the collection and analysis of multiple sources of data that complement and extend participant experiences as told through interview processes (Yin, 2014).

Institutional Profiles

The North Carolina Teaching Fellows Program has five institutional partners and Fellows from each of the campuses participated in the present study. Each institution had participated in the original NCTFP and was selected via a competitive application process to host Fellows as part of the new program (UNC System, 2017). Institutions were evaluated based on the

effectiveness of their current teacher preparation programs, measured by seven criteria including program curricula, applied experiences, extracurricular opportunities, assessment, and student outcomes (NCTFP, 2017). The current partner institutions are Elon University, Meredith College, NC State University, UNC Chapel Hill, and UNC Charlotte. Table 3.1 provides profiles on each of the partner institutions. Table 3.2 provides information about the number of NCTFP participants at each institution, and more details about each institution are provided below.

Table 3.1

Profiles of NCTFP Partner Institutions

	Elon University	Meredith College	NC State University	UNC Chapel Hill	UNC Charlotte
Institution Type	4-year, private not-for-profit	4-year, private not-for-profit; Women's college	4-year, public	4-year, public	4-year, public
Carnegie Classification	Master's colleges & universities: Medium programs	Baccalaureate colleges: Arts & sciences focus	Doctoral universities: Highest research activity	Doctoral universities: Highest research activity	Doctoral universities: Higher research activity
Tuition & Fees (Full-time undergraduate) ^a	\$34,273	\$35,916	\$9,058 in state, \$27,406 out of state	\$9,005 in state; \$34,588 out of state	\$6,832 in state; \$20,266 out of state
Undergraduate Average Net Price ^b	\$33,754	\$25,276	\$13,442	\$11,100	\$14,811
Undergraduate enrollment ^a	6,045	1,682	24,150	18,862	23,914
Graduate enrollment ^a	746	298	10,282	11,049	5,403
Bachelor's degrees conferred in education programs ^{bc}	57	7	146	42	231
2016-2017 Master's degrees conferred in education programs ^b	10	14	290	123	275

Note. All figures are from the National Center for Education Statistics' (NCES) College Navigator tool based on Fall 2017 data (NCES, n.d.-b) unless indicated otherwise. Average net price is generated by subtracting the average amount of federal, state/local government, and institutional grant or scholarship aid from the total cost of attendance. Bachelor's degrees conferred includes only first majors (e.g., a graduate with a first major in a non-education subject would not be included in counts above, even if they have a secondary major in education.

^a Data are from Fall 2017

^b Data are from the 2016-2017 academic year

^c Bachelor's degrees conferred includes only first majors (e.g., a graduate with a first major in a non-education subject would not be included in counts above, even if they have a secondary major in education.

Table 3.2

Number of Teaching Fellows by Campus

	Total number of NC Teaching Fellows as of Spring 2019
Elon University	8
Meredith College	7
NC State University	25
UNC Chapel Hill	15
UNC Charlotte	19
<i>Total</i>	74

Note. Source: UNC System (2019)

Elon University. Elon University is a mid-sized private institution located in central North Carolina. Based on 2017 data, undergraduate students at Elon University are predominantly full-time (97%), age 24 and under (99%), and from outside of North Carolina (80%; NCES, n.d.-b). Undergraduate women outnumber men at the University (60% female). The vast majority of undergraduate students at the institution are White (80%), with 6% of students identifying as Hispanic/Latino, 5% Black or African American, 2% Asian, and 3% as two or more races (NCES, n.d.-b). Two percent of the undergraduate population is categorized as non-resident alien (NCES, n.d.-b). Elon University prides itself on being student-centered, globally engaged, and focused on experiential learning (Elon University, 2019).

Elon University was an original participant in the NCTFP and continued to fund its own version of the program, the Elon Teaching Fellows, after the original NCTFP's end. The Elon Teaching Fellows retained and enhanced many of the existing programmatic structures of the NCTFP based on the original state guidelines, but without the same constraints. In their private Teaching Fellows program, Elon selects cohorts of 25 incoming students (Stancill, 2017c), providing annual scholarships of up to \$5,500. Fellows must remain academically eligible by maintaining a GPA of at least 3.0 and must also complete a series of enrichment opportunities and requirements throughout the program (Elon University School of Education [EUSOE],

2018). Required enrichment activities of the Elon Teaching Fellows program include two winter-term courses, a study abroad semester, at least 40 hours of community service, attendance at cultural events and campus convocations, writing reflection papers, and completion of a research project (EUSOE, 2018). Elon covers the cost of the courses, airfare for study abroad, and seminars for its Fellows, a total that it estimates to be at \$7,500 per participant (J. Carpenter, personal communication, March 26, 2019). Unlike in the current NCTFP, participants in the private Elon Teaching Fellows program may prepare for teaching licensure in any subject area. Further, participants in the private program are not required to pay back any of the funding received and have no obligations for post-graduate teacher service, thus incurring no penalty if they leave the program or do not become teachers after graduating.

Upon being named as a partner campus for the NCTFP, Elon University combined the enrichment activities for the new North Carolina Teaching Fellows into their existing infrastructure for the private Elon Teaching Fellows program and runs these programs in tandem. Instead of the \$5,500 scholarship received by Elon Teaching Fellows, NCTFP Fellows receive the forgivable loans from the state of up to \$8,250/year and, to further incentivize student participation in the NCTFP, Elon may also provide private Teaching Fellows scholarship aid in addition to the forgivable loans granted by the state (J. Carpenter, personal communication, November 26, 2018). Fellows in the NCTFP will complete the same campus enrichment experiences as the Elon Teaching Fellows but will also participate in activities required by the state and will be expected to pay back state funding through post-graduate teaching service. Elon University has two individuals who lead both Teaching Fellows programs on the campus, a director with a faculty appointment and an assistant director. Both individuals were involved with the original NCTFP at Elon (EUSOE, 2018). Elon currently hosts 84 Elon Teaching Fellows across all class years and eight NCTFP participants.

Meredith College. Meredith College is a small private institution and is located in the state's capital, Raleigh, North Carolina. Meredith College is a women's institution, although graduate programs are open to both men and women (Meredith College, 2019b). Undergraduate students at Meredith College are predominantly full-time (95%), age 24 and under (93%), and from within the state of North Carolina (89%). The majority of undergraduate students at the institution are White (71%), with 8% of students identifying as Hispanic/Latino, 8% Black or African American, 3% Asian, 1% American Indian or Alaskan native, 4% as two or more races, and 4% with race unknown (NCES, n.d.-b). Two percent of the undergraduate population is categorized as non-resident alien (NCES, n.d.-b). Meredith College describes itself as "grounded in the liberal arts and committed to professional preparation" and prides itself on providing a strengths-based education for its students (Meredith College, 2019a, para. 2).

Like Elon, Meredith College also began its own independent Teaching Fellows program once the NCTFP ended and has developed its program over time. Meredith's Teaching Fellows program is open to incoming students who are accepted to the institution and participating students may be working toward any teaching licensure area. Students in the Meredith Teaching Fellows program receive \$500 scholarships per year and an additional \$1,000 to apply towards study abroad expenses (H. Bowen, personal communication, November 26, 2018). Fellows in this program incur no penalty for leaving teaching majors or careers. Although Fellows have no teaching-related contractual obligations, the mission statement of Meredith's private Teaching Fellows program suggests that it encourages graduates to teach within the state's public schools: "The Meredith Teaching Fellows Program will instill a sense of mission, service, and professionalism as we 'educate women to excel' as model teachers and future leaders in North Carolina's public schools" (Meredith College Teaching Fellows [MCTF], 2017, p. 5).

At Meredith, NCTFP Fellows have been integrated into the existing infrastructure of the private Teaching Fellows program; currently, the institution has 80 Teaching Fellows in the private program and seven NCTFP Fellows (H. Bower, personal communication November 26, 2018). Fellows in both programs are considered “Meredith Teaching Fellows” and receive the same financial and enrichment benefits. Fellows in both programs participate in a one-credit first-year experience course, honors coursework and an honors thesis, education seminars, social and cultural events, reflection assignments, community service, and field trips to different school types, both in and out of state (MCTF, 2017). During Fellows’ junior year, they also start a two-year internship placement with a mentor teacher in their licensure area (MCTF, 2017). The Fellows programs at Meredith are led by a director who has a faculty appointment and who oversaw the final year of the original NCTFP at the institution, and a program assistant (MCTF, 2017).

NC State University. NC State is a large public institution that enrolls more than 34,000 undergraduate and graduate students. Like Meredith College, NC State is located in the state capital of Raleigh, North Carolina. The majority of undergraduate students at NC State are from the state (84%), full-time (89%), under age 24 (92%), with men (55%) outnumbering women (45%). The majority of students at NC State are White (69%), with 6% identifying as Asian, 6% as Black or African American, 5% as Hispanic, 4% of two or more races (NCES, n.d.-b). Five percent of the undergraduate population is categorized as non-resident alien (NCES, n.d.-b). As a land grant institution, NC State is well-known for its academic programs in STEM (NC State University, 2019; NCES, n.d.-b).

While NC State was a participant in the original NCTFP, unlike Elon University and Meredith College, NC State has not maintained a Teaching Fellows program in the absence of the state funding for the NCTFP. Thus, NC State, like the other public institution partners, has

built its NCTFP infrastructure since being named a partner campus in late 2017. In August 2018, one staff coordinator was hired for the program, a former Teaching Fellow who formerly completed the original program and served as a mathematics teacher within the state (NCSU CED, 2018). Since beginning in the role, the program coordinator at NC State, with the assistance of current Fellows, has developed enrichment activities for students in the program. NC State hosts the largest cohort of NCTFP participants, at 25. Every semester, NCTFP participants at NC State are expected to conduct at least two individual meetings with the program coordinator and participate in at least two social events, one school visit, and one professional development or cultural event. Fellows also create a portfolio about their experiences, including at least two blogs posts per semester about their experiences in the program (Espey, 2018).

UNC Chapel Hill. UNC Chapel Hill is a large public university located within Chapel Hill, North Carolina and is the most selective of the partner institutions (NCES, n.d.-b). UNC Chapel Hill is part of the state's Research Triangle, located approximately 25 miles from Raleigh. Undergraduate students at UNC Chapel Hill are predominantly from the state (83%), full-time (97%), and 24 and under (97%; NCES, n.d.-b). Undergraduate women (59%) outnumber men at the institution (NCES, n.d.-b). The majority of undergraduate students at UNC Chapel Hill are White (62%), with 11% identifying as Asian, 8% Black or African American, 8% Hispanic/Latino, and 4% two or more races (NCES, n.d.-b). The race or ethnicity is unknown for 4% of undergraduate students, and 3% of students are considered non-resident alien (NCES, n.d.-b). UNC Chapel Hill was the first public university in the U.S. and prides itself on its recognition for “innovating teaching,” “dedication to public service,” and the development of a “voice for critical thought” among its students (UNC Chapel Hill [UNC-CH], 2019).

Like the other public partners, UNC Chapel Hill was a former partner institution in the original NCTFP. UNC Chapel Hill currently has 15 Fellows and the program is led by a faculty member with a specialization in special education. The faculty leader receives release time to run the program and, for the first year, there was a graduate student research assistant who additionally supported program operation. UNC-CH's program is centered on four primary pillars: pedagogical content knowledge, equity and diversity, experiential education, and educator leadership (UNC, 2019), and the program anticipates using a new theme every year, right now focusing on "excellence in education," with next year's theme focused on diversity within schools (J. Diliberto, personal communication, January 10, 2019). Students involved in the NCTFP at UNC-CH currently participate in regular meetings and seminars often featuring guest speakers. Students also read a common book (the author is visiting the students), complete service requirements, and take field trips to conduct classroom observations and understand diversity across schools.

UNC Charlotte. UNC Charlotte is a large public doctoral-granting institution located in the largest city in North Carolina, Charlotte. Like the other partner institutions, the majority of undergraduate students at UNC Charlotte are full-time (86%) and of traditional college age at 24 and under (85%; NCES, n.d.-b). Men (53%) outnumber women at the institution (NCES, n.d.-b). Although UNC Charlotte is the most racially diverse of the five partner institutions, it is still a predominantly White institution. Fifty-seven percent of UNC Charlotte's undergraduate students are White, 17% are Black or African American, 10% are Hispanic/Latino, 7% are Asian, and 4% are two or more races (NCES, n.d.-b). The race and ethnicity of 2% of students is unknown and 3% are considered non-resident alien (NCES, n.d.-b). UNC Charlotte's mission is connected to its metropolitan location, referring to the institution as "North Carolina's urban research university" (UNC Charlotte, 2019, para 1). UNC Charlotte's mission statement further iterates its

commitment to “addressing the cultural, economic, educational, environmental, health, and social needs of the greater Charlotte region” (UNC Charlotte, 2019, para 1).

UNC Charlotte was a former partner institution in the original NCTFP and, like the other public institutions, the campus’s Teaching Fellows program ended when the program was defunded by the state. The current program is led by a faculty member at UNC Charlotte who was a Teaching Fellow as part of the original NCTFP and who went on to teach English within the state. The director of the UNCC program receives a course reduction for her time managing the NCTFP. UNC Charlotte has 19 Fellows who meet regularly as a cohort and who are currently working with a makerspace in a school for students with a behavioral diagnosis (H. Coffey, personal communication, November 26, 2018). In their second year of the program, students will read a book and participate in a seminar, with STEM students observing and volunteering at a STEM-themed early college, also helping to execute a science expo. In their third year, students will focus on understanding schools in urban settings and will also engage with lawmakers to think about policy in education. In their fourth year, students will focus on student teaching and teacher training, using existing campus infrastructure for these activities (H. Coffey, personal communication, November 26, 2018).

Recruitment

After receiving Institutional Review Board approval in January 2019, I began data collection. Negotiating entry into the field is an important part of qualitative data collection processes (Clandinin & Connelly, 1988). As detailed above in the institutional profiles, each of the five partner institutions has at least one NCTFP coordinator/director on their campus. These individuals were critical to the recruiting process, serving as the gatekeepers to student participants. After establishing relationships with the coordinators on each campus to learn more about the structure of their respective programs, coordinators at each institution agreed to

distribute a recruiting email to their NCTFP participants preparing for teaching careers in STEM (Appendix B). The email included information about the project and a link to an electronic survey for students to complete if they were interested in participating in the study (Appendix C).

Sampling

Narrative inquiry techniques necessitate the use of a small sample to allow for in-depth exploration, understanding, and presentation of participants' storied experiences related to the research questions. Creswell (2014) recommends the use of only one or two participants. However, existing research on teachers using narrative techniques, particularly dissertation research, typically employs a larger sample (e.g., DeMik, 2008 [five participants]; Endo, Reece-Miller, & Santavicca, 2010 [six participants]; Tomlin, 2008 [eight participants]). As I was interested in representing diverse voices and perspectives while also facilitating opportunity for a convergence of evidence to identify themes across Teaching Fellows, I sought to recruit up to 10 participants for the present study.

To identify participants, purposeful sampling via criterion sampling approach was used. Criterion sampling involves the process of identifying cases that fit a pre-identified set of criteria (Patton, 2002). To meet criteria in the present study, prospective participants for the present study needed to be (a) current Teaching Fellows; (b) enrolled at a partner institution; and (c) preparing for teaching careers in secondary STEM education, including middle school and/or high school levels. NCTFP requirements list eligible STEM licensure programs as high school (grades 9-12) mathematics, science, earth science, physical science, biology, physics, chemistry, middle school (grades 6-9) mathematics, science, and technology, and middle and high school agriculture and technology education (NCTFP, n.d.).

After receiving the study recruiting email from their respective campus coordinators, interested Fellows completed an electronic initial interest survey using Qualtrics (Appendix C).

The initial interest survey contained three mandatory questions that outlined the study criteria above and then asked respondents to indicate their class year, institution, transfer status, home county, teacher licensure subject area, future teaching plans including level of certainty about plans to complete NCTFP service requirements, plans to teach in a low-performing school, and plans to teach in a specific district, students' plans to teach and to teach STEM if they had not been accepted to the NCTFP, and their gender and race.

Participants. Based on criteria above, all participants are current Fellows in the inaugural year of the NCTFP. Thus, all participants had applied to the NCTFP in late 2017, received acceptance to the program in Spring 2018, and began their involvement in the program at one of the partner campuses in Fall 2018. NCTFP members are selected for the program as part of a competitive application process that awards participation to “only the strongest applicants” (NCTFP, 2017, p. 27), based on four primary criteria established by the North Carolina General Assembly:

- (a) Grade point averages;
- (b) Performance on relevant career and college readiness assessments;
- (c) Experience, accomplishments, and other criteria demonstrating qualities positively correlated with highly effective teachers, including excellent verbal and communication skills; and
- (d) Demonstrated commitment to serve in a STEM or special education licensure area in North Carolina public schools. (NCTFP, 2017, p 27)

From these generalized criteria, the founding commission established more specific eligibility requirements. High school or college students with fewer than 24 completed college credit hours were required to have an unweighted 3.0 high school GPA, with scores of at least 24 on the ACT or 1100 on the SAT. College-level applicants with more than 24 college credit hours needed to hold at least a 2.7 GPA to be considered eligible (NCTFP, n.d.).

In addition to receiving acceptance to the NCTFP, Fellows also needed to either already be enrolled at one of the partner institutions, or to apply and obtain acceptance at one of the partner institutions. Applying to the NCTFP and to the partner institutions are two separate processes. Prospective Fellows could apply to the program as high school students, as currently enrolled students not already enrolled in teacher preparatory programs, or as degree holders seeking teaching licensure or a master's degree in teaching. Although the program has a capacity for approximately 130 Fellows (S. Ulm, personal communication, January 29, 2019), only 110 were officially selected for the program's inaugural year (out of 232 applicants) and only 74 students chose to participate (Barkley, 2018; UNC System, 2019). Table 3.3 provides additional insight into the characteristics of all current NCTFP participants.

Table 3.3

2018-2019 NCTFP Participants by Demographics and Subject Area

	Number of NCTFP Participants	Percent of NCTFP Participants
<i>Gender</i>		
Male	13	18%
Female	61	82%
<i>Race</i>		
African American	4	5%
American Indian/Alaska Native	1	2%
Asian/Pacific Islander	4	5%
Hispanic/Latino	4	5%
White/Caucasian	61	83%
<i>Subject</i>		
STEM	53	72%
Special education	21	28%

Note. (UNC System, 2019, pp. 3-4)

Twelve NCTFP members from across the five partner campuses completed the initial survey to indicate their interest in participating in the present study. Among respondents, participants were selected based on their representation of different institutions, with priority given to the first students to respond from a given institution. Eleven total students were invited

to participate (Appendix D) after one student did not respond to an invitation and two follow-up emails regarding participation, with a total of 10 participants. A sample of 10 represents 13% of all current NCTFP participants, and nearly one-fifth of all NCTFP participants preparing for careers in STEM education. Although study participants represent a diversity of experiences and backgrounds, the sample is not intended to perfectly represent all students involved in the NCTFP (Gerring, 2007).

Data Collection

Data for this study were collected in four primary stages: (a) An electronic initial interest survey completed by prospective participants to express their interest in the study and to confirm eligibility; (b) An in-person initial interview, which included (i) completion of a timeline activity, (ii) a semi-structured interview, and (iii) an education history/demographic survey; (c) The second interview, designed to clarify information and experiences discussed in the initial interview and explore emerging themes; and (d) Additional materials provided voluntarily by participants to illustrate early career interests, current experiences in the NCTFP, and that otherwise demonstrate their career development. After all initial interviews were conducted, I created a secure electronic shared drive for each participant with copies of all study materials. In the shared drives, each participant could access their initial interest survey responses, the signed consent form, the interview protocol and my notes from the interview, the interview transcript, a copy of the timeline they created (both original and redacted versions), their completed education/background survey, initial narrative drafts, and any other documents that had been shared by the participant. Participants were encouraged to review these documents, especially the narrative drafted to depict their story, in advance of the second interview. Participants were invited to provide feedback on any of these materials at any time.

Initial interview. While different forms of data may be used for narrative inquiry, interviews are most common (Chase, 2011; Creswell, 2014; Riessman, 2008). All initial interviews were scheduled for 90 minutes and each lasted between 60 and 90 minutes. When possible, it is recommended to interview participants in their settings to “offer the best conditions for storytelling” (Riessman, 2008, p. 26). Accordingly, all first interviews took place in person, in private study rooms within participants’ respective campus libraries when possible, with one interview taking place in a coffee shop adjacent to the student’s campus. All interviews were audio recorded.

Initial interviews contained four primary parts. First, I introduced myself and my background to participants, provided an overview of the study, and asked participants to sign a consent form (Appendix E). Next, I asked participants to complete a timelining activity (Appendix F) to give each participant “time and space” to reflect on and express their experience whilst priming the participant to “think narratively” (Clandinin & Connelly, 2000, p. 21) in preparation for the interview. Third, I asked participants to describe the timelines they created, which led way to a semi-structured conversation guided by interview protocol questions (Appendix G) about participants’ experiences. Finally, participants completed a survey about their educational history and background (Appendix H). Participants were also invited to optionally share supporting documents or materials that illustrated their career development either before, during, or after the interview. At the completion of the first interview, participants received a \$25 Amazon gift card in appreciation of their time and participation. The sections below further detail each major component of the initial interview.

Timelining. Each initial interview began with a timelining activity (Appendix F). Timelining has been used by researchers to allow participants to lead and contextualize their own narrative to inform verbal semi-structured interviewing (Kolar, Ahmad, Chan, & Erickson,

2015). Timelines are visual and arts-based, and researchers have been especially likely to use this method with young and/or marginalized populations to empower and build rapport with participants (Bagnoli, 2009). While the participants of this study do not necessarily represent marginalized identities, empowering the participant is a critical process in narrative research (Clandinin & Connelly, 2000; Connelly & Clandinin, 1990; Riessman, 2008).

In this approach, the participant creates a timeline of their life course, making note of significant events related to the study topic. In the present study, participants were emailed instructions for the timeline activity in advance of the interview and were encouraged to start thinking about the activity ahead of time. Participants were also invited to complete the activity in advance. Instructions prompted participants to create a timeline that represented key events and experiences in their career development, including those that led to participants' decisions to become a STEM teacher and/or to apply to and participate in the NCTFP. Participants were told that there was no "right" way to complete the exercise, that no artistic skill was required, and that they may be as detailed as they would like in constructing the document.

The purpose of the timeline activity was multifold. First, because this research necessitated participants' reflection over their life course beginning with early career ideas, the activity provided a means for participants to "think narratively" (Clandinin & Connelly, 2000, p. 21), beginning to recall, identify, and structure key experiences over time. Second, this activity was minimally structured and produced entirely by the participant, intended to help give participants ownership over their stories and the time and space to identify important experiences without the influence and priming effects of interview questions. Beginning data collection with participants' telling of their own story in their own way is a critical strategy in narrative inquiry, serving to empower participants and prioritize their voice, helping their story to "gain authority and validity" (Connelly & Clandinin, 1990, p. 4). Additionally, when considering life course,

identifying specific periods of time may be easier for participants to talk about than addressing questions about a very wide timeframe (Riessman, 2008) and the timeline allowed for the outlining and focused discussion of particular and noteworthy events. Finally, timelines also served as reference tools in the restorying process of reconstructing narratives in chronological order (Creswell, 2014; Esin, 2011). This activity occurred at the start of the in-person interview and participants were given up to 15 minutes to complete the activity. Participant timelines are available in Appendix I, with personally identifiable information redacted.

Semi-structured interview. In narrative inquiry, instead of a “‘facilitating’ interviewer who asks questions and a vessel-like ‘respondent’ who gives answers” (Riessman, 2008, p. 23), both the interviewer and interviewee serve as active participants in creating a narrative. Riessman (2008) recommends that interviewers use questions to open up topics, allowing the respondent to construct answers in ways that they find most meaningful, with the larger goal of generating detailed stories rather than brief answers to specific questions. Giving up control of a fixed format encourages participants to speak in their own ways, which has the potential to reduce the inherent power relation in interviewing (Riessman, 2008). “Narrative interviewing,” as Riessman (2008) describes, “necessitates following participants down *their* trails” (p. 24). Thus, although an interview protocol was developed to identify the information needed to address the research questions (Appendix J) and used to guide each conversation, every interview took a different shape and held varying degrees of structure.

Once the timelining exercise was complete, the semi-structured interview began. I began each interview by inviting participants to review and describe the events on their timeline, with each interview taking its own unique form from this point. One interview was guided in its entirety by the participant’s detailed telling of their timeline, event-by-event. More frequently, participants’ explanation of their timeline lasted no more than several minutes, then transitioning

to my asking probing questions about the experiences that participants had mentioned. While the protocol questions guided each interview, the data sought by the protocol were often provided within participants' processes of telling their own stories. Each interview focused on the timeline process and events listed, participants' backgrounds and family, K-12 and college experiences, current and anticipated experiences related to teaching and to the NCTFP, understanding of NCTFP service requirements, and career ideas and plans for post-graduation. All interviews were audio recorded and professionally transcribed. I additionally took notes through each interview.

Educational history/background survey. At the conclusion of the first interview, participants were asked to complete a brief survey (Appendix H) about their educational history and additional background information not captured by the initial interest survey. The educational history/background survey asked participants about their high school experiences (whether in state, public/private, and location), age, parent/guardian education levels, whether parents/guardians were teachers, and estimated family income. Participants were also asked to choose a pseudonym for themselves.

Second interview. Within two weeks of their initial interview, participants were given access to a private electronic shared drive with copies of all of their study materials, including an initial draft of their narratives. Participants were encouraged to review these materials in advance of the second interview. In March 2019, participants were invited to complete second interviews. Having "repeated conversations rather than the typical one-shot interview" (Riessman, 2008, p. 26) is a preferred practice in narrative inquiry, especially for projects that study a biographical experience and rely heavily on recall. The second interview, then, in tandem with the electronic shared drive, was a methodological process intended to build trustworthiness of data, and an additional invitation for participants' voice, additional thoughts, and feedback, especially on their

representation within the study. As Riessman (2008) states, “For ethical reasons alone, it is important to find out what participants think of our work” (p. 197).

Second interviews lasted approximately 45 minutes and were conducted in-person, virtually, or over the phone based on geographical proximity and mutual availability. Throughout the initial restorying process, I developed a question list for each participant as I drafted each narrative, outlining experiences brought up in the first interview that would benefit from further clarification or details. Second interviews were intended to serve as a critical step in member checking, with several goals in mind: confirming facts (thus, increasing trustworthiness), providing space for feedback on the written narrative including any concerns about confidentiality, and for exploration of emerging themes. Second interviews were audio recorded and I transcribed these interviews. Participants were compensated with a \$15 Amazon gift certificate for their participation in the second interview. The general protocol template for the second interview is available in Appendix J.

Supplementary materials. While interviews served as the primary form of data collection in this study, I followed case study traditions in supplementing interview data with other sources (Yin, 2014), a strategy that is also becoming more common in narrative research (Chase, 2011). Collecting multiple sources of data allows researchers to better understand the complex environment and contexts that inform and shape participants’ stories and experiences (Chase, 2011; Yin, 2014), and to create a rich, thick description of case context.

Participants were encouraged to optionally share materials that depicted their career development, goals, and participation in NCTFP. I suggested that participants share their responses to short essays required by their NCTFP application, and reflection papers and/or blog posts they may have written during their time as a Teaching Fellow. Participants were invited to submit any materials that they thought may be useful to the depiction of their career development

and decision making and were encouraged to either bring these materials to the first interview, or to share them electronically afterwards. Four participants submitted supplementary materials, descriptions of which are available in Appendix K.

Program stakeholder interviews. Finally, to supplement participant data, I also conducted informal interviews with the statewide NCTFP program coordinator and with NCTFP coordinators at all five partner institutions (Appendix L). These interviews were conducted prior to participant interviews, although additional details were confirmed through subsequent electronic communication. Because the structure of the NCTFP varies by campus, particularly by the enrichment activities and requirements established by campus coordinators, these conversations were particularly useful to understanding the history and operations of the program from the practitioners themselves, data that helped build a more robust description of the NCTFP as a whole, and of each campus program. These perspectives were also critical for considering study implications related to program design and policy implementation. While I took extensive notes during these interviews, these conversations were not recorded.

Analysis

Following Riessman (2008), data analysis took two forms in the present study: thematic narrative analysis and category-centered analysis. Using multiple analytic methods is a common practice among narrative researchers, with varying strategies allowing for an exploration of the multiple layers of meaning that are present within narratives (Esin, 2011). In the first round of analysis, I used thematic narrative analysis to address the first research question, treating each narrative as a unit and identifying themes within each story. Next, I employed a category-centered analytic approach, using the study's theoretical frameworks to guide analysis for the second and third research questions.

Thematic narrative analysis. Consistent with narrative tradition, I constructed, then analyzed, each story on its own: “Narrative study relies on (and sometimes has to excavate) extended accounts that are preserved and treated analytically as units, rather than fragments into thematic categories as is customary in other forms of qualitative analysis” (Riessman, 2008, p. 12). Thus, thematic narrative analysis involves keeping a story intact. To do so, the researcher works through data from one participant at a time, restorying the told experiences to create a sequential order (Riessman, 2008). In treating each narrative as its own entity, researchers better honor participants’ individual agency and acknowledge the personalized context that informs each person’s unique story (Riessman, 2008).

Although researchers do not commonly acknowledge their role in the development and presentation of a narrative, with a biological account seemingly “just emerging from the narrator rather than as part of a conversation” (Riessman, 2008, p. 59), I felt it important to situate context within the narratives below, particularly where probing questions provided clarifying information and insight. The narratives in Chapter 4 therefore represent participant experiences but may also include acknowledgement of the interview context, where certain responses may have been prompted by certain questions. Regardless, Chapter 4 shares each participant narrative as a whole unit, providing not only a lengthy account of the experiences described by participants from multiple stages of data collection, but also summarizing details to address research questions within the context of the individual’s personal sociocultural history.

To analyze data, I first took a thematic narrative approach. Immediately following initial participant interviews, I created a centralized electronic drive with all participant documents, had interviews transcribed, and began to write each narrative, working primarily with data from the interview, supplemented by the participant’s timeline, initial interest survey, the educational history/background survey, and any additional documents that the participant may have shared. I

sorted through these data to create a sequential account of the person's individual career development, starting with the first event that the participant had identified on their timeline, and proceeding to the participant's ideas about their future plans and goals. As I organized data into narratives, I used subheadings to organize and visually depict themes present within each narrative. After each narrative was organized with descriptive subheadings, I replaced subheadings with in vivo codes wherever it made sense to do so to honor participants' own words (Saldaña, 2015).

Category-centered analysis. Although Riessman (2008) advocates for the preservation and analysis of narratives as units, she also acknowledges that this analytic approach may be combined with category-centered analysis, the strategy frequently employed by other qualitative traditions, to gain different insights of the phenomenon of interest. Taking a categorical approach requires a strong theory, as researchers return to the data to identify segments according to theoretical components (Riessman, 2008). For category-centered analysis, I used a deductive coding strategy based on broad theoretical components: sources of self-efficacy in the case of SCCT analyzing participants' career development and perceived NCTFP cost and benefits under behavioral economics principles in the case of participants' decision making regarding the program. Using these large deductive schemata as a foundation, I then coded transcripts to identify nuanced categories within these larger themes. As part of this process, I again replaced descriptive themes with in vivo codes where appropriate to honor participant language even across units (Saldaña, 2015).

Trustworthiness

Narrative epistemology is constructivist in nature; the researcher and participant work in tandem to construct a narrative in the "context of a perspective," in which a participant's own understanding of their story and life course are prioritized (Riessman, 2008, p. 9). To achieve

trustworthiness through this design and epistemology, I held myself accountable in two ways that balance narrative and case study traditions, respectively. First and most important, I strove to restory each participant's complex life course in a way that accurately reflected the experiences and contexts that led participants to their present-day involvement with the NCTFP. Here, I was most accountable to the participants themselves, as ethical and trustworthy narrative research is steeped in collaborative processes. Below, I detail member checking processes that sought to achieve not only data verification, but mutual meaning making and, ultimately, accurate representation within and across narratives. The second strategy was based on a more objective truth and reflects my effort to provide a factually accurate account of the NCTFP case. As the positioning of an individual's experience in both history and place is a guiding principle of life course (Elder et al., 2013), defining the NCTFP in detail, including its manifestation across campuses, served to create a properly rich, thick description of context for participant narratives. The robustness of a case description is critical in its allowance of the reader sufficient information to compare situations across other settings and research (Merriam, 2002).

To achieve the first goal, I used member checking, defined as "seeking verification with the response groups" (Mertens, 2015, p. 269). Although participants were not involved in the initial design of the present study, I regularly sought their input and perspectives after the initial interview. After each interview, I created a secure electronic drive for each participant, where copies of all documents and narrative drafts were shared. Participants were encouraged to review documents and to make changes as they saw fit to ensure that their stories were accurately reflected and that their identities were appropriately disguised. Because of the criticality of taking work back to participants in building trustworthiness in narrative research (Riessman, 2008), I felt it critical to conduct second interviews and to compensate participants again for this time, thus providing space for their feedback on the written narratives and emerging themes.

In addition to member checking with the participants, I also relied on regular communication with various NCTFP stakeholders. Prior to participant interviews, I conducted interviews with NCTFP coordinators and directors on all five campuses, conversations that were critical to my understanding and construction of the larger NCTFP case in the sections above. I also conducted an interview with the coordinator of the statewide NCTFP program to confirm case details and program policies. Throughout the research process, I maintained communication with all of these stakeholders, relying on their assistance for participant recruitment, and also following up via email questions about their programs and the NCTFP as a whole.

To further enhance trustworthiness both within narratives and in the presentation of the case, I employed multiple data sources to supplement, corroborate, and triangulate interview data (Creswell, 2014). The multiple sources of data sources collected directly from participants included initial interest survey responses, timelines, interview data, background surveys, second interview data, and any submitted documents. During and immediately after each interview, I wrote memos to record ideas of interest, observations that might warrant further exploration, and ideas about developing themes.

Because narrative inquiry relies largely on participants' own accounts and the researcher's restorying of these narratives, transparency and the provision of detailed information on methodology and interpretations of data are critical to building trustworthiness (Riessman, 2008). To achieve this, participant communication and all study documents are presented in the Appendix, including copies of recruiting emails to gatekeepers and participants, all documents used to collect data, and copies of participants' created timelines, although identifying information has been redacted. Although participant narratives went through countless rounds of edits in the interest of succinctness, they remain extensive. Data are presented in ways that sought to maintain and emphasize meaning, and to do so in participants' own language as often

as possible. Similarly, with the criticality of the researcher in co-creating knowledge in narrative research, I acknowledge my own experience and background in the section below to position the lens through which I approached this work.

Positionality Statement

The role of the researcher as an instrument is critical within the constructivist paradigm and narrative inquiry methods (Clandinin & Connelly, 1990, 2000; Creswell, 2014). To increase reliability of the research design and analysis, reflexivity is critical. First, I am not a teacher, I have never participated in a teacher education program, and I do not have an academic background in STEM. I grew up in western New York in a small town that, although rural, provided me access to a strong K-12 public education. Following high school, I attended a public university close to my hometown, SUNY Geneseo, an institution known for its teacher preparation programs. Many of my friends and extended family members entered teaching careers. While my own career decision making process was non-linear, I chose to pursue a master's degree and a career in higher education. After completing this degree, I served as a career advisor to undergraduate students at two private institutions in North Carolina prior to, and during my initial year of pursuing a Ph.D. As a career advisor, I met with hundreds of undergraduate students in the midst of important academic and career-related decisions. These conversations had a deep impact on my understanding of student career development.

My work as a career advisor shaped my eventual research agenda of understanding the multiple influences on college students' career interests, goals, and outcomes. Having anecdotally witnessed the influence of cultural and financial variables on students' career ideas and goals, I became interested in the enabling and inhibiting influence of college costs on career ideas. Over the past year, teacher strikes have occurred across the U.S., including a large rally in Raleigh, North Carolina in May 2018, which I attended due to my growing interest in the topic.

These movements continued to fuel my interest in issues related to teacher recruitment, the costs and benefits of entering teaching careers, and policy solutions aimed at addressing shortages in the K-12 teacher workforce. North Carolina's lauded Teaching Fellows program was to be reinstated in the coming 2018-2019 academic year, offering an ideal opportunity to study the intersection of educational policy and student career decision making at a time of heightened sociopolitical attention to state and national issues surrounding the public support of education, particularly regarding teacher compensation. I saw my position in this study as a "willing student, eager to be taught" (Coles, 1989, p. 22) about the experiences and life histories of the North Carolina Teaching Fellows. I further sought to foster community, connectedness, and mutual purpose in my interactions with each participant, empowering their voices and honoring their experiences in the retelling of their stories.

Limitations

Studying participants in the inaugural year of the new North Carolina Teaching Fellows program offered both opportunities and limitations. All participants are in the first year of the newly designed program and five of the participants in the present study are in their first year as undergraduate students. Research suggests that many students make career decisions throughout the duration of their college careers and, as a result, much of students' understanding of teaching work may be based on their own personal experiences as students rather than as teachers. At the time of data collection, participants also not have yet experienced any statewide enrichment activities that will distinguish the experience of being a Teaching Fellow within the state. While interviewing students at this early stage provides the advantage of recency in Fellows' decisions to apply to and enroll in the NCTFP, the implications of these decisions are not yet fully understood by participants. Further, participants' outcomes and actualized behaviors in relation to program expectations and personal career goals are yet to be seen.

A second limitation in this study is the distribution and background of current students. While I sought to build a sample of participants that represents diversity by institution, and, ideally, by racial and gender characteristics, educational status, socioeconomic characteristics, educational plans, and future goals, the small sample necessitated by a narrative design limits my ability to capture a wide range of experiences between participants. Yet, the characteristics of study participants are reflective of current Fellow and teacher dynamics both in North Carolina and across the country, overrepresented by women and White teachers. In the first year of the program, there are only 74 students involved (this study therefore included over 13% of all current NCTFP participants), with only 13 students of color and 13 male students (UNC System, 2019). Limited diversity across Fellows in the first year of the NCTFP can likely be attributed to several shortcomings in the program's design, including the lack of emphasis on racial and gender diversity in the new program's objectives, the limited number of host campuses, all of which are predominately White institutions, the hurried application timeline, and limited recruiting resources. Thus, the experiences of the Fellows featured in this study may not be reflective of experiences of all NCTFP participants, especially those whose background characteristics are not represented or underrepresented within the present sample. At the same time, while the experiences of participants are rich, narrative inquiry is not intended to serve as a method that generates results that are generalizable to the larger population (Creswell, 2014). Career development is highly individualized, and the stories shared are unique to students' respective experiences and environments.

Last, while the benefit of narrative inquiry is to understand the storied histories of study participants, it is near impossible to capture all relevant details of a lived experience in the space of two interviews. While I have taken steps to encourage participants to take an active role in sharing their story through several mediums, I acknowledge that this process falls short of

depicting the full lives and contexts of each participant. Although I have taken steps to address this limitation by using the timeline activity to guide a narrative conversation, conducting informal interviews with campus stakeholders, collecting supplemental data for triangulation, and conducting intentional member checking processes, this dynamic remains a shortcoming of the present research.

CHAPTER 4

PARTICIPANT PROFILES AND NARRATIVE THEMATIC ANALYSIS

In this chapter, I first provide an overview of participants via brief profiles. Next, to address the first research question, I present detailed life course narratives from each of the 10 participants, preserving narrative stories sequentially and structurally to treat each as its own analytic unit, a “hallmark of narrative” (Riessman, 2008, p. 12).

RQ1. What are the storied experiences of participants in the new North Carolina Teaching Fellows Program pursuing careers in secondary STEM education?

Using narrative thematic analysis, this chapter identifies themes in each participant narrative using subheadings. In Chapter 5, the reader will find a category-centered analysis, as is more typical of qualitative research, to answer the final two research questions through the lens of the study’s theoretical frameworks. Riessman (2008) clarifies that these two strategies, narrative thematic analysis and category-centered analysis, can be combined to obtain unique insights and a different way of knowing a particular phenomenon. These analytic strategies are used in tandem in the present study to explore the career development and decisions of students involved in the North Carolina Teaching Fellows Program (NCTFP) and to understand the ways in which the NCTFP influences and incentivizes students to prepare for careers in secondary STEM education.

Participants

Participants are 10 students in the North Carolina Teaching Fellows Program. Although study participants represent a diversity of experiences and backgrounds, the sample is not intended to perfectly represent all students involved in the NCTFP (Gerring, 2007). All participants are represented by pseudonyms in the present study; participants were encouraged to choose their own pseudonyms and nine did so. Tables 4.1 presents participants’ demographic

information. All participants were between the ages of 18 and 22 at the time of the first interview. Eight participants are originally from North Carolina, and nine attended high school in the state. Nine participants are female and one participant is male. Five participants are White, non-Hispanic, two participants are White and Latina/Hispanic, two participants are African American/Black, and one participant is American Indian/Native American. Four participants are first-generation college students in that neither of their parents or guardians hold a bachelor's degree. Six participants have at least one parent with a bachelor's degree, three participants have two parents with at least a bachelor's degree.

Table 4.1

Participant Demographic Information

Pseudonym	NCTFP Institution Type	High School State	Age	Gender	Race	Parent/Guardian 1 Highest Education Level	Parent/Guardian 2 Highest Education Level
Monica	Public	NC	18	Female	White	Bachelor's degree	Some college
Victoria	Public	NC	18	Female	White	Some college	Some college
Taylor	Private	NC	18	Female	White	Graduate/Professional degree	Associate's degree
Christy	Public	NC	19	Female	African American/Black	Graduate/Professional degree	Graduate/professional degree
Zoe	Private	NC	19	Female	African American/Black	Graduate/Professional degree	High School/GED
Jenna	Public	NC	20	Female	White	High School/GED	High School/GED
Matilda	Public	NC	20	Female	White & Hispanic/Latina	Graduate/Professional degree	Graduate/Professional degree
Kristen	Private	Out of State	20	Female	White & Hispanic/Latina	Graduate/Professional degree	Bachelor's degree
Kyle	Public	NC	21	Male	White	High School/GED	Some college
Felicity	Public	NC	22	Female	American Indian/Native American	Associate's degree	High School/GED

Participants represent all five NCTFP partner campuses although individual institutional affiliations are not revealed in the interest of confidentiality. Seven participants attend public institutions, three attend private institutions. Five participants are first-year undergraduate students, one participant is a sophomore, three participants are juniors, and one participant is a master's student. Four participants are preparing to become math teachers, three are preparing to become science teachers, two are preparing to become technology teachers, and one participant is deciding between science and math. Five participants are planning to teach in high schools, five are planning to teach in middle schools. To protect participant confidentiality, I have replaced some academic program names with more generalized terms. Table 4.2 summarizes participants' postsecondary academic information.

Table 4.2

Participant Academic Information

Pseudonym	NCTFP Institution Type	Class Year	Academic Major or Program	Licensure Focus/Preferred Level
Monica	Public	First-Year	Science Education	High School
Victoria	Public	First-Year	Middle Grades Education (Math & Science)	Middle School
Taylor	Private	First-Year	Mathematics	Middle School
Christy	Public	First-Year	Technology Education	High School
Zoe	Private	First-Year	Environmental Science & Political Science	Middle School
Jenna	Public	Sophomore	Middle Grades Education (Math & History)	Middle School
Matilda	Public	Junior	Chemistry	High School
Kristen	Private	Junior	Middle Grades Education (Math) & Experiential Education	Middle School
Kyle	Public	Junior	Technology Education	High School
Felicity	Public	Master's Student	Master of Arts in Teaching (Math)	High School

PARTICIPANT PROFILES

Below, brief profiles provide an overview of each of the 10 participants. In the following section, detailed life course stories are presented using narrative thematic analysis.

Monica

“My younger brother is autistic. It made me want to be a special education teacher. Then, when I came to college, they were like, ‘We don't have that here.’ I was like, ‘Okay, well, that works for me because I also wanted to be a science teacher.’”

Monica is an 18-year old first-year student at a public institution in North Carolina. Monica is a White female who completed her K-12 education within the state and attended a charter high school. One of Monica’s parents has a bachelor’s degree and the other completed some college at the same institution that Monica now attends. Monica enjoyed school while growing up and often played teacher when she was young. While Monica considered several career options, teaching remained a consistent interest over time, even in spite of one of her favorite teachers advising her not to enter the career. Monica was especially interested in teaching special education because of her experience with her younger brother, who has autism, or environmental science due to a positive experience in this subject while in high school, which was taught by another favorite teacher.

As Monica considered her plans for college, her high school guidance counselor told her about the NCTFP. Monica applied to the NCTFP with plans to become a special education teacher. Monica was excited to be accepted to both the NCTFP and to her top choice institution, which happened to be a partner institution. After enrolling, Monica learned that this institution did not have an undergraduate special education program. As a result, Monica switched to secondary science education, focusing on environmental science. While Monica would have likely attended the same institution even without the NCTFP, as this was her top choice and her

most affordable option, the NCTFP had some influence on Monica's selection of science education. After her college graduation, Monica plans to enter a high school teaching position in earth or environmental science to complete her NCTFP service. Monica is unsure whether she will plan to teach at a low-performing school, although she does not expect that the shorter NCTFP service opportunity will influence this decision. Monica expects to teach science in North Carolina long-term.

Victoria

"I don't exactly want to [teach] middle grades or special education or even high school, but this is something I'd be willing to sacrifice to be able to go to college."

Victoria is an 18-year old first-year student at a public institution in North Carolina. Victoria is a White female who attended public K-12 schools within the state. Both of Victoria's parents have completed high school/GED credentials and both attended technical colleges after high school, although neither completed postsecondary degrees. Victoria's mother has always wanted to teach elementary education and currently works as a preschool teacher. Victoria has planned to be a teacher since she was young, often helping her own teachers as she was growing up and then gaining more formal internship experiences in elementary schools while she was in high school. Victoria planned to study elementary education and applied to colleges with this goal in mind, before the NCTFP had been announced.

As a first-generation college student, Victoria was especially concerned about the cost of college and, while still in high school, she began to consider attending a community college instead of a four-year institution to save money. Victoria first learned about the NCTFP through high school teachers who told her about the program and encouraged her to apply. Seeing the NCTFP as a way to attend a four-year institution while still meeting her teaching career goals, Victoria applied to the program. Once she was accepted, Victoria changed her original plans

from elementary education, instead now preparing to become a middle grades teacher in STEM. Victoria lived at home and commuted to college during her first semester, with the NCTFP loans covering the full cost of this semester, although she has since moved on campus. Victoria plans to pursue concentrations in both science and math and is not yet sure which subject she'll teach. The NCTFP directly influenced Victoria's college and academic program choice and is likely to influence her post-graduate plans as well, compelling her to teach in-state before she potentially leaves North Carolina to teach elsewhere. Without the NCTFP, Victoria thinks it is likely she would have prepared for a career in elementary education and would have left the state immediately after her college graduation. Victoria is unsure whether she will teach at a low-performing school once she enters the teaching workforce.

Taylor

“After a few years in a regular public school, when I finally understand how to control a classroom, how to reach out to kids, how to test, how to do all the actual teaching things, then I'll be able to make a better decision of whether or not Title I is for me.”

Taylor is an 18-year-old first-year student at a private institution in North Carolina. Taylor is White and female, with one parent with a graduate/professional degree and another parent with an associate's degree. Taylor is originally from North Carolina and completed her K-12 education at public schools within the state. Taylor is planning to become a middle school math teacher at the completion of her degree.

Taylor has been interested in becoming a teacher her whole life, due in large part to teacher role models including her mother, a friend's mother, and an especially encouraging math teacher in sixth grade. Taylor chose to pursue a teaching career while in high school, originally deciding between music and math subject areas. Taylor became interested in the private institution she now attends as a result of an admissions counselor visiting her high school, and

Taylor first learned about the NCTFP while at an open house event for this institution. Taylor credits the NCTFP for helping her to afford to attend the private institution, which was her top choice college. Taylor is involved in both the private Teaching Fellows program at her institution and the NCTFP. Taylor has relied on the advice of teacher mentors when thinking about her post-graduate plans and, as a result, she plans to start her career in a school that is not considered low-performing, instead wanting to build her skills before entering a low-performing school environment later in her career. Taylor applied to the NCTFP for the financial support offered by the program; the NCTFP did not influence her decision to enter teaching, her decision to teach math, her college choice, nor does she expect it to have an influence on her immediate post-graduate plans, as her original goals already aligned with the program's requirements.

Christy

“I still wasn't sold on teaching, but I remember the dean called me and we spoke about the [technology education] program.... I was like, ‘Okay, I'll be able to get what I want through this, have a little help paying for school, and I can teach afterwards.’”

Christy is a 19-year old first-year student at a public institution in North Carolina. Christy is studying technology education and minoring in design studies. Christy is an African American/Black woman and grew up attending STEM-focused private and public schools in North Carolina. Both of Christy's parents have graduate or professional degrees and her mother was a Teaching Fellow in the original NCTFP before working as a teacher and a principal. Although Christy is from North Carolina, she originally planned to attend college out of state near extended family members and planned to study computer science, a goal that her parents originally supported. At the last minute, Christy's parents revoked their support for this plan due to growing concerns about college costs and not wanting Christy to take out loans. Christy's mom had encouraged her to apply for the NCTFP and Christy's acceptance to this program

provided the family a compelling option that would enable them to cover remaining college costs without Christy taking out loans.

Originally upset by this abrupt change in plans, Christy felt better about the decision after a dean at her current institution called her to talk about the technology education program. Christy especially likes that her current major is building her technology skills, as she feels she will be prepared for careers in both the technology industry and in teaching. While Christy is confident that she will complete all NCTFP post-graduate teaching service requirements, she sees herself leaving North Carolina afterwards and is considering a career at an out-of-state family-owned technology company once her service is complete. The NCTFP directly influenced Christy's college choice, major choice, and future plans.

Zoe

“If I do science, which I'm good at, then I can get the money to get through school, and then later I can go back and get certified to do social studies. Three years or five years of teaching science is not that bad if I'm considered good at it.”

Zoe is a 19-year old first-year college student at a private institution in North Carolina with a double major in environmental sustainability and political science, planning to obtain teacher licensure in middle school science. Zoe is an African American/Black woman who completed her K-12 education at public schools within North Carolina. Zoe has one parent with a graduate or professional degree, and a second parent with a high school diploma/GED. Zoe's grandfather also taught middle school science within the state. Zoe is currently a member of three teacher preparation and support programs: the NCTFP, the private Teaching Fellows program at her institution, and a Future Teachers Program associated with the K-12 school system she attended.

Growing up, Zoe was a successful student and enjoyed helping others. Although it wasn't necessarily her top career choice, Zoe could always see herself becoming a teacher due in part to having multiple educators in the family. Zoe first learned about the NCTFP through the College Foundation of North Carolina website, an online resource with information on scholarships and grants. Although Zoe was more interested in teaching language arts and social studies, Zoe's first-choice institution was a private institution and the NCTFP funding was important to helping her afford to attend this institution. The NCTFP compelled Zoe to plan to teach science education, a subject that she had always done well in and had gained firsthand experience in through helping her grandfather. Because the Future Teachers Program Zoe participates in requires her to return to her former school system after graduating, Zoe plans to meet these requirements and those of the NCTFP simultaneously by teaching middle school science within this system. Zoe further plans to teach at a low-performing school because she attended one herself and feels that this environment is where she can make the biggest difference. After completing her service, Zoe would consider the possibility of gaining certification to teach other subjects and, longer-term, could see herself becoming active in education policy or politics.

Jenna

"I always knew I wanted to be a teacher, but I wanted to solidify that before I chose my college or dedicated myself to education...I don't want to waste my time in college, because it's a lot of money."

Jenna is a 20-year-old sophomore at a public institution in North Carolina. Jenna is a White woman originally from North Carolina. Jenna completed her K-12 education in public schools within the state. Jenna's parents both completed high school/GED credentials and her father also holds licensure as an electrician. Neither of Jenna's parents attended college. Jenna is

a middle grades education major with concentrations in math and history and plans to become a middle school math teacher after her graduation.

Jenna grew up wanting to be a teacher and had been active in extracurricular activities towards this goal, including helping to start a Future Teachers of America chapter at her high school. As a high school student, Jenna took a number of career technical education (CTE) classes to further confirm this goal before college. A first-generation student, Jenna's parents encouraged her to attend college, even if it required taking out loans. Jenna applied to several North Carolina public institutions and selected an institution where she felt she would get the best applied classroom experience early in her program. To keep costs down, Jenna has applied to many scholarships and funding opportunities and first learned about the NCTFP through an email sent out by her education program during her first year in college. Jenna recently learned that she was eligible for only two years of NCTFP funding instead of the three years she had originally thought. Jenna plans to stay within North Carolina, at least short-term, to teach middle school math. Jenna is unsure of the type of school she would like to teach at after graduation, as she feels like she doesn't yet have a strong sense of what teaching at a low-performing school would entail. Long-term, Jenna is interested in attending graduate school to get her master's degree and possibly a doctoral degree in education.

Matilda

"I've had people ask my mom, 'Are you okay with her doing that? Why are you letting her become a teacher?'"

Matilda is a 20-year old college junior at a public institution in North Carolina. Matilda is a White and Latina/Hispanic woman and completed her K-12 education at public schools within the state. Both Matilda's parents have graduate degrees; her father is a lawyer and her mother is a doctor. Matilda does not have any immediate family members in teaching careers but has been

interested in becoming a teacher for most of her life, despite frequently encountering advice not to do so. Matilda's parents supported her interest in teaching and Matilda also credits a strong teacher role model that she had in high school, a former Teaching Fellow herself, for her interest in the career and her understanding of sociopolitical dynamics that affect the profession.

While in high school, Matilda was active in music and she initially planned to study music education, although she was concerned about the job security of arts education. Reconsidering her plans several times at the end of high school and during her first semester of college, Matilda decided to major in chemistry, a subject that she had worked hard in during high school. Matilda has also early-affiliated with her institution's Master of Arts in Teaching program to obtain teaching licensure immediately after completing her bachelor's degree. Matilda first learned about the NCTFP through Facebook two days before the application, noticing that the program's eligibility requirements fit her existing plans. Matilda plans to teach high school chemistry in North Carolina after graduation to meet NCTFP service requirements but sees herself moving out of state afterwards, due largely to the lack of incentive pay for teachers with master's degrees in North Carolina. Matilda is unsure of the type of school she will teach at and, although she would like to teach in a low-performing school, she is unsure whether she is sufficiently prepared to teach effectively in this environment. The NCTFP service requirements will not influence this decision for Matilda.

Kristen

"I need to get the [teaching] experience anyway, probably going to do that in North Carolina because I'm going to be licensed here, why not get some money for it also?"

Kristen is a 20-year old college junior at a private institution in North Carolina, majoring in middle grades education and experiential education. Kristen is a White and Latina/Hispanic woman who completed her K-12 education at private schools in her home state before choosing

to attend college in North Carolina. One of Kristen's parents completed a graduate/professional degree and the second has a bachelor's degree. Kristen has a number of family members in teaching, including her mom who now works as a guidance counselor, and Kristen grew up with an interest in becoming a teacher herself. Kristen has also always enjoyed math and chose to become a math teacher while in high school.

Kristen applied to colleges throughout the country before choosing a private institution in North Carolina, where she had been accepted as a Teaching Fellow in the institution's private program. Kristen first learned about the NCTFP through her involvement with the private Teaching Fellows program on her campus. Because she was already planning to become a middle school math teacher, Kristen applied to the NCTFP to reduce her college costs. While Kristen's long-term goal is to return to her home state and to teach at the same school she attended, she was advised to gain teaching experience before applying. The NCTFP gave Kristen a concrete plan for after graduation, compelling her to stay in North Carolina short-term to gain this experience. Kristen expects to teach in the state for at least four years regardless of school type and plans to live with a close friend, also involved in the NCTFP, while the two begin their teaching careers after college. Kristen does not currently have a preference regarding teaching in a low-performing school and still hopes to eventually become a teacher at her former school in her home state.

Kyle

"When I applied for [the NCTFP] I thought it was just a scholarship, but it's a forgivable loan...I was like, 'Alright that's fine, I'll go teach, I'm not opposed to it.'"

Kyle is a 21-year old college junior at a public institution in North Carolina. Kyle is male, White, and is originally from out of state. Kyle's family moved to North Carolina when he was 12 and Kyle attended public school in North Carolina, transferring high schools after his first

year when his family moved again. One of Kyle's parents attended some college, and the other holds a high school diploma/GED. Kyle has enjoyed hands-on work throughout his life and developed an interest in engineering careers while growing up.

Kyle chose to attend a public institution in state hoping to study engineering. After struggling in engineering pre-requisite courses, Kyle found himself reconsidering majors as a college sophomore. Kyle especially enjoyed a course on 3D modeling and his professor recommended that he consider technology education, a subject that would allow him to continue to take related courses with the added flexibility of earning a teaching licensure, even though Kyle was not necessarily interested in becoming a teacher. Immediately after he made this switch, Kyle received an email about the NCTFP, which he believed to be a scholarship program. It was not until he joined the NCTFP that Kyle realized that the program's funding came in the form of forgivable loans, which made Kyle consider teaching more seriously. Although Kyle has had a positive experience in his education major and in gaining related classroom experience since becoming involved in the NCTFP, Kyle is most interested in a career in architecture. Kyle is considering applying to jobs in both teaching and architecture after college to weigh his options financially. If he were offered a high-paying job outside of teaching, Kyle could see the value of paying his NCTFP loans back in cash rather than service. If Kyle does enter teaching after graduation, he plans to teach in a low-performing school because he himself attended low-performing schools, and because he is interested in completing his service more quickly. Kyle is also looking into other loan forgiveness programs for teachers that he may be able to combine with the NCTFP to relieve more debt if he does enter teaching.

Felicity

"You'd be a good teacher, but you'd also be really good just with math in general... your ability would be better suited in engineering or some sort of math field, rather than just teaching."

Felicity is a 22-year old master's student at a public institution in North Carolina. After finishing college in December 2017 with bachelor's degrees in mathematics and American Indian studies, Felicity is now in a one-year Master of Arts in Teaching (MAT) program working towards licensure to become a high school math teacher. Felicity is an American Indian/Native American woman from the Lumbee tribe and was raised primarily by her mother who holds an associate's degree.

Felicity has been interested in teaching throughout her life and often played school as a young child. Felicity has also been highly successful in math throughout her education. Although Felicity initially planned to study math education in college, Felicity was persuaded to consider applied math based on her achievement in the subject. In college, Felicity chose to study math instead of math education, allowing her to take on a second major in American Indian studies. While Felicity's professors and family members encouraged her to pursue careers related to these subjects, a conversation with a math education professor during her final semester in college inspired Felicity to revisit her original career interest in math education. Felicity graduated from college a semester early and worked to save money while applying to MAT programs within the state.

Felicity first learned about the NCTFP through one of her college professors, as the program fit her already-established career plans. Felicity chose to attend an NCTFP partner institution to obtain her master's degree, an institution that also offered her a merit award to cover tuition and fees throughout the academic year. Between the two financial aid awards, Felicity took on only a small amount of loans to cover her expenses during her master's program. Felicity is currently student teaching and has already signed a contract with a school system in North Carolina, the same system she attended, to teach high school math. The NCTFP already aligned with Felicity's career goals and has had no influence on her post-graduate plans.

NARRATIVE THEMATIC ANALYSIS

Monica

Early Interests: “I Would Always Play Teacher”

As a child, Monica remembers playing school, “I would always play teacher completely by myself,” as her three brothers were uninterested. Monica had both indoor and outdoor play classrooms complete with a blackboard and chairs, which her father, a woodworker, helped her put together. When asked, Monica suspects she played school because she “loved” going to school “for all the nerdy reasons... learning things and completing the projects.” Monica sums, “When I was out of school, all I wanted to do was relive my time in school.”

Monica continued to play teacher as she was growing up, although she remembers receiving advice not to enter the profession throughout her life: “People were always telling me when I was growing up, ‘You don't want to be a teacher. They don't make any money.’” Monica said this advice most often came from teachers, including “one of [her] favorite teachers” whose “opinion [she] really valued”: “I couldn't believe that a teacher was telling me not to become a teacher because they didn't get paid a lot.” Monica says, “All of [the deterring advice] was about money,” which was not a convincing argument for her. Monica suspects that money is not a high priority for her because of her background: “I didn't grow up in a house that always had money ...The area I lived in was very affluent, but my family was not. I guess that's why it doesn't matter to me because I didn't grow up with all of that.” For her, the money “wasn't even a factor” in choosing careers.

Still, Monica says this advice impacted her ideas about teaching, “That took me back for a long time, do I really want to become a teacher if a teacher is telling me not to become a teacher?” Throughout high school, Monica explored other career ideas as well, considering becoming an author, lawyer, and even a surgeon, a career Monica says she had read about. She

explains, “I guess also when you read tons of books, you just want to be everything that you read about.” Monica had also considered her love for reading and writing in her decisions: “When I got into high school...I always loved reading and writing, so I was like, ‘Oh, I want to do something with English.’” This interest seemed underscored by a family history; Monica’s grandfather had been a college professor in English and philosophy and, although he died when she was young, Monica had often been told that she was similar to her grandfather.

Although Monica received advice not to enter teaching, her family encouraged her interest. Monica remembers talking to her grandparents, her “toughest critics,” about this plan:

I was like, “I think I decided what I want to do.” [My grandmother] was like, “What?” I was like, “I think I want to become a teacher.” She was so happy for me.... I was so taken aback...That was a big turning point for me. All of my grandparents were like, “I think that’s the perfect thing for you.” I was like, “What? Okay, then I have to do it now.”

Teaching Goals: “I Want to Become an English Teacher”

Throughout high school, teaching was “always in the back of [Monica’s] mind.” Monica describes her experiences with two “really good” teachers who especially inspired this interest. Between Monica’s love of reading and having an English teacher with a “sense of humor” she appreciated during her sophomore year, Monica first saw herself as a potential English teacher: “I had a really good English teacher that I really liked, and I was like, ‘Okay, one hundred percent I want to become an English teacher.’” However, her English teacher recommended that Monica not enter teaching, which made her rethink this plan. Simultaneously, Monica realized that while she loved reading, she did not enjoy the books from her classes: “I was like, ‘I don’t think I could become an English teacher if I really hate all these books that I’m probably going to have to be reading for the rest of my life.’”

After she had counted out becoming an English teacher, Monica took Advanced Placement (AP) environmental science: “I had a really good earth science teacher and that’s when I decided that I wanted to teach high school science.” While English had come naturally to Monica, science did not: “If I did well in it, it was because I was putting in hours and hours and hours of work.” Still, she loved the subject. Monica says,

[The class] made me realize how cool it was that you weren’t always just sitting there doing the same thing every single day... sometimes you have to take notes... But other times you’re doing really cool things, like making gardens or compost piles.

While Monica had especially liked her English teacher’s personality, she said, “I didn’t think he was enjoying himself every day.” Her science teacher, however, acted and spoke far more positively about teaching: “My science teacher, I loved her as a person, but I also loved how she taught... I could tell she enjoyed it every single day. When Monica told her science teacher she was interested in teaching, the teacher encouraged her interests and told her: “You need to become a teacher. It’s the best career ever. It’s so rewarding.”

Senior Project: “I Published a Children’s Book”

As a high school senior, Monica had to complete a capstone project for her school and was also working toward her Girl Scouts Gold Award, in which she had to do “80 hours of service” towards “something sustainable.” To do both simultaneously, Monica came up with the idea to write a book based on her younger brother with autism. Monica and her brother worked together on the project: she wrote the book’s content and he illustrated pages and gave feedback on the story. The project helped the two build a stronger relationship: “I always had a close relationship with him... But that project alone helped me get a lot closer with him.”

When the book was done, Monica visited classrooms to read it out loud to students, an experience she found she enjoyed even more than the writing:

I read [the book] to so many classes, and I was like, “This is so fun. I love this” ... That was really what made me decide... I wrote something, but I like sharing it with all these people more than I actually liked putting it together and writing it.

Monica started to consider becoming a special education teacher, an interest furthered by this project but also due to her lifetime experience with her brother and with an uncle who has cerebral palsy. Monica’s mom, however, encouraged her to keep her options open, reminding Monica that she could pursue any type of career she wanted: “You already have so much exposure. You can do that anytime you want... Just because you have an autistic brother [doesn’t mean you] have to go into special ed.”

Financing College: “It’s a Normal Thing to Take Out Loans”

As she thought about college, Monica especially wanted to “go away to a big school,” a goal she “purposefully worked for all four years of high school.” Still, Monica, a self-described “really big worrier,” was concerned about college costs, especially because she has a twin and other siblings close in age: “I was like, ‘I don’t even know if I can afford to go where I want to go because...my parents are going to have all four kids pretty much in college at the same time.’” Still, Monica’s parents encouraged her to go:

[My mom] was scared that I was going to have to be paying off [student loans] for a really long time. But then she said to me, “Everyone has to do it. Most of my friends are either finishing or have just finished paying off their loans. It’s a normal thing to take out loans to go to college...I don’t know how much help I’m going to be, but you just need to know that even if you have to take out loans, it’s normal...Don’t stress about the money, because it will be fine. You’ll work it out” ...She made me feel a lot better about it.

Monica navigated the college and financial aid process independently, going to a workshop about completing the FAFSA and doing all of the paperwork on her own.

As she prepared to apply for college, Monica met with her high school guidance counselor to discuss college and her career ideas. For the meeting, Monica had made a list of her top careers of interest. Although she cannot remember what she had listed first, Monica recalls listing teaching second: “At that point I think I knew that I wanted to be a teacher, but I was still afraid to commit to it.” Monica’s counselor told her that there were a number of funding opportunities available for studying education if she was serious about teaching: “I was like, ‘Alright, well, that's something on my list, bring it on. Show me whatever you got that would help me.’ She showed me maybe the Teach Grant or something.” Monica’s counselor also told her about the NCTFP. Monica describes having done “a lot of research” on her own and vaguely remembers coming across information for the NCTFP but says that she wasn’t sure if it was “a reliable thing” until the conversation with the counselor. Monica’s guidance counselor also gave her fee waivers to help her pay for the SAT and ACT.

After this meeting, Monica began reading about the NCTFP. While Monica hadn’t known about the original NCTFP, her uncle had known a former Teaching Fellow: “He was telling me she said it was the best thing she did in college.” As she looked at the program details, Monica says, “It was specific and very easy for me to understand the expectations” and remembers thinking, “This is awesome”:

I remember being like, “Oh my gosh, science or special ed? I'll take both, all of the above. I will do every single thing on this list.” I was so amazed that there was something out there that existed like the Teaching Fellows program.

Monica felt that the program “laid everything out extremely clearly.” She says,

It was a little scary to think about the fact that it’s not a scholarship, it’s a forgivable loan, so you need to commit to doing this. I was nervous about it but at the same time I was like, “I have never committed to something in my life and not followed through...I have

no intentions of leaving North Carolina. I love North Carolina, so I don't know why I wouldn't commit to something like that. And I want to teach.”

Monica shared the information with her parents, who were also excited about the opportunity: “My parents read over it, they were like, ‘This is amazing. This is amazing.... This is great.’” In addition to the funding, Monica’s mom was also excited about the non-financial aspects of the program: “My mom was all about that stuff.... you get to go on all kinds of field trips, see different schools...that's what my mom liked about it.” Monica explains that the funding is the primary reason why she applied, although the enrichment opportunities provided an added bonus: “At first it was a financial thing, but then there was so much more to be excited about than just the money aspect.” Because she was interested in both science and special education, the program seemed to fit her interests exceptionally well.

Choosing a College: “Everything Aligned so Well”

Because she used fee waivers on her SAT and ACT exams, Monica received application fee waivers from a number of colleges and used them all, applying to 10 institutions: “I can’t just throw any of them away.... So, I used all of them.” Despite applying to so many institutions both in- and out-of-state, Monica only seriously considered three options, all in-state public institutions. Monica was especially interested in one institution, where her father had attended to college, although he had not finished his degree. Although Monica says this family connection “didn’t make my decision for me,” it “pushed” her: “All I’ve been hearing my whole life is [institution] is the best place ever.” Still, Monica expected the decision to come down to cost: “At the end of the day... [the institution] to give me the most money is where I was going to go.”

Monica’s top choice institution ended up becoming a partner institution for the NCTFP. However, once the partner institutions were announced Monica applied to a second partner campus as well, another public institution, to increase her odds of participating in the program.

Monica counted out the private NCTFP institutions based on cost and counted out the third public partner institution because it was “too close” to her home. Monica was initially deferred from her top choice institution and was not admitted to the second institution, temporarily shifting her plans to attend a public institution not affiliated with the NCTFP. However, in Spring 2018, Monica received acceptance to her top choice institution on what she describes as “the best day ever.” Shortly after, Monica found out she had gotten into the Teaching Fellows program too. Monica’s top choice institution “ended up being the best financial option,” with various financial aid sources providing enough money “where [she] only took out a \$5,000 loan for [her] first year of college.” Of all of these plans coming together, Monica says, “I knew it was a sign that I needed to be a teacher... everything just aligned so well.”

Special Education: “We Don’t Have That Program”

Monica had originally applied to the NCTFP for special education, although she later learned that the institution she had selected did not offer an undergraduate major in this subject. Monica describes, “When I came to college they were like, ‘We don't have that [special education program].’ I was like, ‘Okay, well, that works for me because I also wanted to be a science teacher.’” Monica says, “I just assumed that when I had read the Teaching Fellows thing that all the schools had all the programs that were on there.” Since she had been deciding between science education and special education, Monica says she was not disappointed by this: “Before I wanted to special ed, I wanted do high school science. I still have that interest. Honestly, I can always add on special ed at some point in my life.”

NCTFP Experience: “The Amount of Opportunities I Get”

Monica has had a positive experience with the NCTFP. As part of the program, Monica especially enjoyed a visit to a school that was unlike anything she had seen before: “They don't have any classrooms that looked like anything that I had in my school.” Monica has also built

strong relationships within the program: “It’s not even just about the financial [support]. The amount of opportunities I get... My roommate is a Teaching Fellow and I may not have met her...now she’s the best friend I’ve made here.” Additionally, since joining Monica has realized the wide network that lingers from the original NCTFP: “Anyone I met... It was mostly older people...they were like, ‘Are you a Teaching Fellow?’ I would be like, ‘Yes,’ and then they immediately were like, ‘Oh my gosh, that’s so amazing.’ It was crazy.”

Future Plans: “Keeping My Options Open”

After college, Monica plans to teach earth science, as inspired by her own AP environmental science teacher, also interested in teaching high school because of her lasting connections with her own high school teachers. Monica is less sure of where she might teach and the type of school she may teach at: “Honestly, I have no idea.” Monica talks about the possibility of working at a school near her institution or near her home, and also says she is considering working at a “low-income school,” although doing so would likely mean working outside of the area where she’s from “because it’s not low-income.” Having enjoyed the “close-knit” environment of the charter school she attended, Monica would also consider teaching at a charter school. Because Monica sees herself staying in North Carolina to teach, the NCTFP “is not a factor” in the type of school she will choose: “If I’m planning on staying in North Carolina, what do I have to lose by committing to eight years instead of four?” At this point, Monica is “keeping [her] options open.”

Victoria

Early Interests: “I Always Knew I Wanted to be a Teacher”

Victoria’s timeline begins with kindergarten: “I’m one of those people who always knew I wanted to be a teacher.” Even at an early age, Victoria remembers being interested in teaching, which she attributes in part to her mom, who “always wanted to teach elementary education.”

Victoria's mother had not attended college but told Victoria that, if she had had the chance to attend, she would have become a teacher. Because of her own experience, Victoria's mom was especially encouraging of Victoria and her siblings to attend college: "She always wanted us to go to college because she didn't get the opportunity...It was important to her." Although she did not have a college teaching credential, Victoria's mom pursued educator roles by teaching bible school and later becoming a preschool teacher: "When she finally became a teacher, I was like 'I want to do that too. If she can do it, I can do it too.'"

Victoria also had positive experiences in school and, although she "went through a variety of different career choices in elementary school, she kept teaching [in the back of her mind]." In school, Victoria found that her teachers often asked her to help out in the classroom: "I've always been the teacher's pet... 'Can you go do this for me?' Or, 'Can you go help so-and-so?' ...From kindergarten, it was always like, 'So-and-so needs help learning their alphabet, can you help them?'" This continued throughout Victoria's education and, by sixth grade, Victoria realized that teaching others was something she was good at:

I was in a class with several students who had special needs and the teachers were like, "You're really good at working with the students, how about you go help them out?" It was an opportunity for me to be like, "Okay, this is really cool. I'm really good at this."

Teacher Role Models: "I Want to be a Teacher Just Like Him"

When Victoria thinks back over her schooling, she mentions two teachers who helped her like math and science. Victoria first describes her eighth-grade math teacher:

I've always been the kind of student to catch on to things really fast. But I wasn't catching on to a lot of these topics. I remember staying after for tutoring...before that, that's never something I've done...I remember [the teacher] going to the whiteboard and working out the problems multiple times for us... so that we could really see how he was

doing them. I remember him talking through them step-by-step, really just making sure we understood them before he moved on...He even did that kind of stuff in class... We all ended up being really successful in that class.

Up until this point, Victoria had done well in math, but it “was never [her] thing” and she had never thought of it as “fun” until this teacher. Victoria’s eighth-grade math teacher was “one of [her] most influential teachers” and inspired her continued interest in the profession: “I was like, ‘I want to be a teacher just like him. I want to make students love math.’”

Similarly, Victoria described another teacher role model from when she was in tenth grade, a science teacher. Again, although Victoria had “never liked science,” she enjoyed this class: “We always did fun experiments...I was like, ‘Okay, maybe I like science.’” Victoria maintained a close relationship with this teacher, who “guid[ed her] through the rest of high school.” Victoria still communicates with this teacher today.

Choosing Teaching: “This is More than it Appears to be on the Outside”

Throughout high school, Victoria participated in career and technical education classes “for people to wanted to be teachers,” allowing her to gain experience in elementary schools and confirm her interest in teaching: “I was like ‘Okay, yeah, this is definitely what I want to do. This is it.’” Victoria then completed a year-long internship in teaching during her senior year, where she visited an elementary classroom every day: “I was really working hands-on with these kids and not just observing...really getting to get in there and actually do teaching things.” Victoria also helped with “copying and setting up her bulletin boards,” gaining a better understanding of teachers’ full responsibilities: “I knew teaching wasn't all just teaching, I knew there was other stuff to go along with it, but I didn't realize there was this much other stuff.”

In addition to learning about the profession through direct, hands-on experience, Victoria’s time in the classroom also gave her an opportunity to talk to teachers about their jobs:

I remember one day sitting down with a group of third grade teachers...they're all sitting at this table and stopping their conversations to look at me and be like, "Are you really sure you want to do this?" I was like, "Well, I mean, I think I am." Then they start telling me all the horror stories of being teachers.

Victoria says, "I got lots of conversations like, 'Are you really sure you want to be a teacher? This is what it's like. Are you sure you want to do this?' I'm like, 'Oh Boy.'" The teachers Victoria worked with were especially frustrated with the school administration, often warning her about this challenge of the job: "[The teachers] were dealing with problems and trying to get them fixed and they weren't able to be fixed because of the constraints that they had with administration." Yet, Victoria says these conversations didn't deter her: "It gave me an opportunity to see the different perspectives and realize this is more than it appears to be on the outside but it's an opportunity to be ready for that for when I become a teacher."

College Cost: "The Most Important Thing"

As she solidified her career interests in becoming an elementary school teacher, Victoria began to discuss her options for college with her high school counselors. Victoria applied to five colleges with her teaching interests in mind, four in-state public institutions and one out-of-state public institution where one her tenth grade science teacher had since become a professor. After receiving admission to the out-of-state institution, Victoria had hoped to attend, looking forward to "get[ting] out of North Carolina and [doing] something different," but ultimately chose not to "because of the money." Victoria's parents were especially vocal in this decision: "They were like, 'We don't want you to be in debt the rest of your life. As a teacher, you're not going to be making a lot of money. You're never going to be able to pay this money off.'" Victoria says her parents' comments "kind of forced" the cost of college "to be the most important thing to [her]."

After applying to college, Victoria began to realize that the cost of a four-year institution may be too high for her to attend:

I applied to [the four-year institutions] because that's what I was told to do [by the school] ...I started looking at everything and I'm like "Okay, wait. This may not be something I can do." That's when I started looking into our local community colleges.

While Victoria originally hoped to leave the area she had grown up in, she realized that the cost of college may be prohibitive: "Once I started realizing [college] is going to be really expensive...I was like, "I've been here for eighteen years, I can tolerate being here for another two to go to community college, then I can go wherever I want."

The NCTFP: "I Can Go to a Four-Year University Now"

It was after Victoria had already applied to colleges that she heard about the NCTFP through the teachers at her school. Fortunately, two institutions she had already applied to were host campuses for the program, including one near her home. Victoria says, "I found out about Teaching Fellows and then I was like, 'Okay, I can go to a four-year university now.'" Victoria's teachers had known about her career goals, telling her: "I know it's not exactly what you want, but it could still be a great opportunity for you":

They were like, "You need to apply for this... I was like, "Is this really that big of a deal?" Because I didn't hear too much about it, I was like, "This is kind of okay, whatever. Yeah, I'll apply for it" ...More and more teachers started telling me, "You need to apply for this, you can definitely get this. We'll write your recommendations. You're going to be a great teacher" ...really encouraging me to apply. I started looking into it and realizing "Hey, this is pretty good."

Victoria had not known about the old NCTFP, although her teachers, and some of the teachers where she interned were familiar with the program: "They were like, 'We used to have that and

then they took it away.’ I was like, ‘Oh okay, they’re bringing it back now and I get the opportunity to do it.’”

Victoria applied to the NCTFP but was unsure of whether she would be competitive for the program:

I was like, “This is great. Who wouldn’t take the time to apply to this? You’d be crazy if you don’t.” I was like, “There’s no way I’m going to get this.” I mean I had good grades, and I had good references and everything like that, but I was like, “There are people who are way better than me academically, and I’m sure you can have way better references than me” ...I was like, “I’m not going to get it.” But I still [applied]. I was just like, “Why not?”

While Victoria says her decision to apply for the NCTFP was a result of the funding, she was also interested in the network of support the program would provide: “I can get a community of teachers along with me since I don’t really have that. A community of teacher to work through college with me, basically.”

Although Victoria was excited about the NCTFP, the program did not fit her original plans to become an elementary teacher: “It was kind of like, ‘Am I sure I want to basically change up my entire career path just for a scholarship?’” Victoria says, “I [didn’t] exactly want to do middle grades or special education or even high school, but this is something I’d be willing to sacrifice to be able to go to college.” Victoria worked with her school counselors to “figure out [her] options” and to make “the best decision.” Victoria especially valued her counselors’ advice because her parents focused only on the financial part of the decision: “I can ask my parents all day and they’re going to be like, ‘Take the money, take the money. You need to take the money.’ Because that was the only way that I was going to those colleges.” Victoria’s school counselors helped her contact the institutions she was considering to understand each

institution's academic program offerings: "We made lots of phone calls trying to figure out what was the best option to get me closest to where I wanted to be."

Getting into the NCTFP narrowed Victoria's choice down to the two partner institutions she had applied to with the decision coming down to money: "Who can make this the most worth it for me to be going to their school?" Ultimately, Victoria chose the institution closer to her home: "First semester, I actually stayed at home and Teaching Fellows completely covered all of my expenses for school." Victoria has moved on campus for her second semester but anticipates moving back home and commuting for the rest of her education. Although participating in the NCTFP meant that she would not become an elementary school teacher, Victoria believes the funding to be worth the sacrifice:

With staying at home and taking Teaching Fellows, I go to school completely for free.

That wasn't an opportunity that I would have gotten without Teaching Fellows. I didn't get any money from the state, I didn't get any money from the school. Teaching Fellows is the only financial aid that I'm getting. Without Teaching Fellows, we would be paying a whole lot of money and taking out a whole lot of loans... Financially, it wasn't going to be possible for me to go to college without something like this.

Victoria is currently planning to pursue concentrations in both science and math and is still figuring out which subjects she will teach after graduating:

I haven't one hundred percent declared my concentrations yet, but it's going to be math and science. Obviously for the STEM factor of doing Teaching Fellows...and, I was like, "I had these great teachers who really showed me science and math can be fun...I want to get the chance to show other students that science and math can be fun, too."

During her first year in college, Victoria has spent time in middle school classrooms in both science and math and has "enjoyed it so far." Overall, however, Victoria says she hasn't done too

much with the NCTFP. On her campus, the Fellows meet once a month. Victoria explains that the program “isn’t super organized at this point,” because “they’re in the beginning stages of getting it started back up again.” Beyond the campus activities and the funding, Victoria says she still doesn’t know a lot about the program as a whole: “All I know from it at this point is that they give us money.”

Teaching at a Low-Performing School: “Pay it Back Quicker”

Victoria is “very certain” she will complete her NCTFP service requirements, and although she says some components of the program are “a little unclear,” she thinks it’s mostly “self-explanatory”: “You do this and you’re good or you do this and you’re good. I think for the most part I understand what I have to do I order to repay it.”

In our first interview, Victoria shared her plan to enter a low-performing school: “At this exact moment, I would like to teach at a low-performing school and pay it back quicker,” although she expresses more uncertainty during our second meeting. Victoria’s primary reason for considering a low-performing school is that she “[doesn’t] want to teach in North Carolina for that long.” Originally, Victoria had hoped to attend college and start her career out of state: “My original plan was to...immediately move to another state. The only reason I was even getting my degree in North Carolina is simply for the in-state tuition.” Victoria explains that she is especially interested in moving out of state in order to earn a higher salary:

Teachers in North Carolina just don’t make enough money in order for me to feel like I could make a living for myself and enjoy my life. I was like, “I don’t think it’s going to be able to happen here.” That was another thing a lot of teachers have told me, “Are you going to teach in North Carolina? You’re not going to teach in North Carolina, right? You’re leaving here, right?” That was something that’s always been pressed into me: “Do

not teach in North Carolina. Do not do that.” I think that's also a part of why I made the decision that I was like “I'm not going to be teaching here.”

Although she is most interested in moving out of state, Victoria could see herself returning to the schools she herself had attended in order “to give back.” Victoria says, “I would love to go back to my middle school and get the opportunity to teach there”:

I'm keeping my options completely open...If I get to that point and there's a job open at my middle school for a math or science teacher, I'm going to take it...Even though that would mean having to teach in North Carolina for several more years than I anticipated, I'd be okay with that. Just to get that opportunity.

As a first-year student, Victoria feels that she still has plenty of time to make these decisions.

Taylor

Early Interests: “It Was Fun Pretending to be a Teacher”

The first event on Taylor's timeline occurred in second grade, when Taylor's mom, a teacher, began work at the same school that she attended: “I would stay after school every day with her and help her in the classroom. I would go around and help all the other teachers on her team. It was fun pretending to be a teacher.” This interest continued throughout elementary school, where “playing school was [Taylor's] favorite thing in the world.” Taylor says, “For Christmas, all I wanted was school supplies...I got a whole desk and it was the best Christmas ever for me.”

Teacher Encouragement: “Super Empowering”

Being in the presence of good teachers was important to Taylor's interest in becoming a teacher herself. Taylor's sixth grade math teacher was especially memorable:

I think this is when I really decided I wanted to be a teacher. My sixth-grade math teacher... made math easy for us to understand, he taught it in ways that were engaging

to us, that wasn't just straight up notes. Looking back, one thing I notice is that he genuinely cared about all his kids, and I thought that was awesome.

Taylor remembers earning a 98 average in the class and, at the end of the year, Taylor's teacher encouraged her to pursue a higher level of math the following year. Taylor says, "I was always smart, I always got good grades, but I had never had a teacher say, 'You're good, here's something that I think you're capable of doing,' and really putting that belief in me":

[The teacher's encouragement] was super empowering. I just remember the last day I saw him he was like, "You're going to do great, you're going to do great things." I think that whole year with him really set me on a track towards math and put me in a good environment in a classroom.

Although Taylor took her teacher's advice to take a higher level of math the next year, the experience did not go smoothly: "We had a test within 10 days of school and I failed it, and I came home, and I just cried." That was "the first time that had ever happened...not just in math, but in school in general." While Taylor dropped the class, she remained interested in math.

Choosing Teaching: "Math Education and Music Education"

Taylor went on to have "some good teachers, some bad teachers" throughout middle and high school. Although she describes "hat[ing] high school with a very strong passion," Taylor became active in band and began to consider a career in music education: "I started off freshman year wanting to go into music education because I had been in band for three years, and I had just joined marching band. I was like, 'I love band, I want to do this forever.'" Taylor's mom, however, gave her other advice: "She was just like, 'You don't want to do band forever, it's just not worth it.' She sort of shot my hopes down and I was like, 'No, I'm going to do it anyway.'"

Although Taylor's mother is a teacher and "loves her job," her mom "has never been the biggest supporter of [Taylor] going into education." Instead, Taylor says her mom told her:

“There are so many other things you could do that pay so much better.” Still, Taylor has remained undeterred:

[My mom] knows she is not going to change my mind no matter what she says so she’s like, “Just teach somewhere that isn’t where we grew up, because they’re one of the worst counties in North Carolina for pay...Go somewhere else that will pay you better, don’t stay here and teach.” She tried to get me to move up north, because that's where they pay.

Taylor’s mom had also suggested other careers based on Taylor’s interest in math, including engineering. Taylor says her mom recommended that she “stick with math” but also that she was capable of doing “more than just education.” Although Taylor’s mom tried to talk her out of the career, Taylor describes that her mom also liked being a teacher herself: “She’d try and talk me out of it but also be like, ‘But, I love what I do.’ She'd contradict herself five seconds later.”

Taylor has heard similar perspectives from other teachers as well: “Other teachers I talked to...they’re always like, ‘I love what I do but the pay sucks.’ That's been the general consensus.”

In high school, several experiences “reinforced” Taylor’s interest in teaching, especially jobs in babysitting and tutoring: “There was this girl in my neighborhood that I tutored. I loved explaining a problem to her and hearing her go, ‘Oh I get it now, we just do this and this.’ I'm like, ‘Yes.’ I loved that moment.” Taylor began to look into teaching more seriously, weighing her interests in math and music:

Junior year I started digging into the difference between math education and music education. Part of me wanted to go into music because I loved it, but I also know it’s not really practical because who knows what’s going to happen to arts education.

Taylor had conversations with her chorus and her pre-calculus teachers about teaching in each of the two subjects. Taylor’s chorus teacher assured her that she had already demonstrated her

ability to teach music because she often helped lead the class. Taylor's pre-calculus teacher also reassured her interest in math education, sharing thoughts about math being "one of the easier subjects to teach as far as grading and lesson plans." The teacher also warned Taylor about difficult parts of teaching the subject: "A lot of times, kids come into math already hating it before the first day, and sometimes it's just really tough to break kids out of that." While choosing between the two subjects, Taylor had a negative experience with her band teacher, an experience that helped solidify her decision toward math. Between this experience, seeing math as more "practical," and Taylor's sustained positive experiences in the math throughout her own education ("It just always clicked for me, math always made sense, I always found it interesting, I always liked going to math"), Taylor began to plan for a career in math education.

College Choice: "I Want to Go There"

Taylor applied to two colleges, one public and one private institution in North Carolina. Taylor first heard about the private institution during an admissions counselor's visit to her chorus class and she remembers leaving the presentation thinking, "I want to go there." Taylor especially liked that the institution allowed students to "major in the content area [they] want to teach" and to work toward teaching licensure separately. By contrast, Taylor would have majored in education with a concentration in math if she attended the public institution. Although Taylor was confident that she wanted to attend the private institution, the high cost was discouraging: "I wanted to go to [institution], but my mom was like, 'you're not going to [institution] unless you get a lot of money.'"

Teaching Fellows: "You Pretty Much Graduate with Job Security"

Taylor first heard about the NCTFP while at an open house event for prospective students at the private institution. Because the institution had their own Teaching Fellows program, the private program has a booth set up at the open house event. Taylor and her mom met the

Teaching Fellows coordinator at the open house and learned about the NCTFP. At the time, the institution was waiting to learn whether they would become a partner campus. While Taylor hadn't heard of the original NCTFP, her mom was familiar with the program.

Soon after, the institution was named an NCTFP partner institution and Taylor applied to the NCTFP and their private Teaching Fellows program. Taylor was admitted to both programs and received additional financial support from the institution, making her attendance at the institution possible. Taylor says, "The second we heard about [the NCTFP] we were like, \$8,000 a year, we're applying because that's a lot of money, that's super helpful. I wouldn't be going here if it weren't for all the money I had gotten." While Taylor thinks it's possible her parents may have found a way to finance her attendance at the private institution because she "really wanted to go," Taylor credits the NCTFP for solidifying her ability to attend the institution.

Currently, Taylor is involved in the NCTFP and her institution's private Teaching Fellows program. Because there haven't yet been any statewide events for the NCTFP, Taylor's only association with the program is the funding it has provided: "We haven't really done much with it. We have a conference in April up at Western Carolina, but that's really it. It's sort of just been, 'Here's some extra money.'" Instead, Taylor credits her institution's private Teaching Fellows program for the activities she has been engaged in, describing the private program as "super amazing." Taylor especially appreciates the institution's connections with the local schools and the amount of applied experience that the Teaching Fellows, saying "You pretty much graduate with job security in four years." When asked to elaborate, Taylor says that she is confident she will be able to get a teaching job as a result of the training she is participating in, and through the network she is building through the private Teaching Fellows program. Taylor says her primary motivation in applying to the NCTFP was "money," while she applied to the private Teaching Fellows program at her institution "more for experience."

Future Plans: “I’m Probably Going to End Up Staying in North Carolina.”

Taylor plans to teach middle school math after her college graduation and is “very certain” she will meet all NCTFP service requirements. Taylor says she understands the requirements “pretty well” and that the program “worked out perfectly because [she is] probably going to end up staying in North Carolina anyway.” Taylor says the biggest decision will be “whether [she] want[s] to do four years in a Title I school or eight years in a public school.” In her interest survey for this study, Taylor indicated that she was not planning on teaching in a low-performing school immediately after graduation, a decision based largely on advice received from her mother:

My mom had worked in a Title I school and she was like, “They’re great, but if you go there right off the bat, you’re going to get burned out. It’s hard to teach kids when you’re learning how to become a teacher and you’re also trying to teach kids who might not have had breakfast in three days.” So, she was like, “I think if you want to go to Title I that’s great but learn how to teach first.”

Taylor’s best friend’s mother, “another huge role model” for Taylor’s interest in education also teaches in Title I schools and “sort of said the same thing.” Taylor describes, “[She] waited, I think, 20 years before she went into Title I schools...She said she thinks she would have quit if she had went there right off the bat.” Taylor says she is unsure about the type of school she would like to end up in long-term, but she expects to start her career in a “regular public school,” potentially teaching at a Title I school later in her career: “When I finally understand how to control a classroom, how to reach out to kids, how to test... then I’ll be able to make a better decision of whether or not Title I is for me.” After graduation, Taylor plans to search for jobs in middle school math education, which was her original career goal even prior to the introduction of the NCTFP, although the program is compelling her to stay in state.

Christy

Early Interests: “I Was Always Messing with the Computer”

Christy’s interest in STEM, especially technology, began at an early age. As a child, Christy’s parents involved her in many activities, including “piano, violin, soccer, swim,” and also took her to a popular science and technology museum within the state. Christy says, “I think [my parents] put me in everything just to see what I gravitated towards.” Christy especially enjoyed working with technology and, once she became old enough for school, her parents enrolled her in a private STEM elementary school. As an elementary student, Christy joined a technology club where she would help turn off and restart computers and watch videos about simple technology. In fifth grade, Christy also got involved in the student news at her school, first working “production and teleprompter” before she was eventually in front of the camera. As a child, Christy says she was “always messing with the computer.” Christy’s parents “would show [her] TED talks about technology” and she remembers watching Apple keynote speeches which, she says, were “my favorite thing, like a holiday for me.”

STEM Middle School: “Everything Started Taking Off for Me.”

At the end of elementary school, a magnet middle school with a STEM program opened near Christy and her fifth-grade teacher encouraged her to apply. Christy says, “That was when everything just really started taking off for me technology-wise”:

It was just so eye-opening for me that this field was something that I wanted to be a part of. In eighth grade, I was in the bio moto team. We had to build a car, and then we had to go to a competition and learn how to take apart the NASCAR group that they have....My grandpa was a mechanic at one point so I became really interested in cars...and buildings, and the mathematical aspects of it....That middle school really helped me learn that and also helped me develop my people skills.

In addition to the STEM skills that she was learning, Christy was also chosen as a peer tutor, a role where her responsibilities were “interacting with students who were having a hard time [transitioning into the school].” Christy would “show [students] around” and help students with math and science schoolwork. Christy says, “I think that [was] my first experience with tutoring and helping other students. I think that was when one of my teachers said, ‘Hey, maybe you should consider becoming a teacher or think about helping other students.’” Christy says, “Still, I was like, ‘I don’t know.’”

Information Technology in High School: “I Continued on my STEM”

At the end of middle school, Christy’s mom told her about an information technology (IT) program in the public high school where she worked as a principal:

I applied for that program, and I got in. That’s when I continued on my STEM, but it was more focused toward information technology, coding, becoming certified in different languages like CCS, and JavaScript, and Python. Different programs like that.

Because Christy has changed schools, she “wanted to...make more friends and get out there.” At the time, Christy’s technology teacher was also the cheerleading coach, leading Christy to join cheerleading: “I loved [this teacher] so much. I was like, ‘She’s an awesome teacher. She’s probably going to be really fun as a cheer coach as well.’” Christy was also involved in student council, through which she also volunteered to tutor students in math: “I helped ninth grade students...I would help them look at the problems in a different way so that they could understand.” Christy enjoyed this work: “It was great just to help other students.”

As part of the IT program, Christy took extra STEM classes in high school. In ninth grade, Christy’s mom had also encouraged her and her two younger siblings to join a local chapter of the National Society of Black Engineers where they would participate in competitions across the east coast. At this point, Christy says she was considering a career “around technology

or engineering,” thinking also about “graphic design and webpage design,” a field that her uncle worked in through the military. Recognizing this interest, Christy’s teacher recommended her for an internship during Christy’s senior year where she helped a local diocese film “a public service announcement about giving back to the community.” “She was like... ‘they’re looking for someone. I really think that you could do this.’ So, I did it.”

College Choice: “I Don’t Want Student Debt for You”

Christy has family in the Midwest who own a technology company. Based on her own growing interests in technology and the location of this family, Christy’s original college goals were to attend a large institution out of state and to study computer science. Christy “didn’t really have a set number one school” but wanted to attend a school with a strong athletics culture, initially focusing her search on questions like: “How big is the school? Do they have a good football team? Basketball team?” Academics were considered secondarily, with a focus on computer science programs. When it came time to apply, Christy applied to several large out-of-state institutions and to one North Carolina institution that happened to become a partner institution for the NCTFP. Christy later heard about the NCTFP from her mom, who was a Teaching Fellow herself. Christy says her mom, “Emailed [her] the application and said, ‘Hey, you should apply for this’...She was like, ‘I did this program.’” When asked if her mom wanted her to become a teacher, Christy explains that her mom did not push her into teaching but wanted to “give her another option.”

Christy applied to the NCTFP, but she still planned to move out of state: “I had my heart set on going to the Midwest. I didn’t want to stay here.” On Christmas Day, Christy received admission from her top choice school, an out-of-state institution with a computer science program and with an athletics program she had long followed. Christy was accepted into other institutions as well, including the North Carolina institution, and eventually to the NCTFP.

Although Christy's parents had encouraged her original college plans, Christy said they changed their minds late in Spring 2018, "on the last day you can decide." Christy says, "You're being told for months on end that you can go...I had a roommate, I already paid the fee that you pay after you get in...we were set and ready and then one day my parents said 'No.'" Christy attributes her parents' change of heart to an increasing concern about the cost of college:

I was okay with taking out loans and doing whatever I had to do. My parents weren't... my parents were like, "No loans, we're not doing that." That's a big reason why I didn't go to [the out-of-state institution], the money and my parents saying, "I don't want student debt for you, I don't want you to have things to worry about besides college."

Christy's acceptance to the NCTFP seemed to seal her parents' decision for her to stay in state: "When I did get the Teaching Fellows, my mom was like, 'That is even more of a reason for you to stay.'" Christy suspects that, had she not gotten into the NCTFP, she may have actually gone to the original institution she planned to attend.

NCTFP: "I Still Wasn't Sold on Teaching"

Christy says she didn't really look into the NCTFP on her own, instead deciding to "apply and let's see. If I get it, then I'll see what it's about." At the time she applied, Christy's knowledge of the NCTFP was limited: "I really only knew that they helped pay for school in a loan-type deal and, in exchange, you had to teach for a certain amount of years." After she was accepted into the program, and after it seemed that she may be staying in North Carolina after all, a phone call from a dean at the North Carolina institution helped Christy accept the decision to stay in state and to pursue technology education through the NCTFP:

I still wasn't sold on teaching, but I remember the dean...called me and we spoke about the [technology education] program that [institution] has here. I was like, "Okay, I'll be able to get what I want through this, have a little help paying for school, and I can teach

afterwards. I've taught before in high school, so I guess I'll just be doing that on a much larger scale after I finish my undergrad."

Christy explains that the conversation helped her to feel "a little bit more at ease." She says, "I think just having someone else tell me besides my parents really helped me make my decision." Further, Christy also received financial aid from the institution in addition to the NCTFP funding. Although she doesn't know exactly how the program influenced her cost of attendance, Christy says the program allowed her parents to pay the difference without taking out loans: "I don't really know how much it was, my parents just said, 'Okay, your bill is paid' and that was that."

When asked if salary differences between careers in teaching and computer science factored into these decisions, Christy explains that she "didn't really look into salaries" but that the decision seems like a trade-off, spending more money for a degree in a higher-paying field, or less money on a lower-paying career (while still gaining skills that may leave her qualified for other options):

It was in the back of my mind, if I go to [out-of-state institution], I will be spending however many thousands I would need and if I do [computer science], it would definitely help, it would definitely make it worth it. But here, it's different. Here I'm in-state, I don't really have a financial burden on me right now, and I have decided to go into a profession that pays significantly less from what I would do.

Christy isn't concerned about teaching salaries at this time, even if she has heard this concern about the teaching profession as a whole:

I think everyone's concern about teaching is the money aspect, but I really don't care about the monetary gain, as long as I'm just helping the next generation of students learn what they need to learn, and get out in the world, and make a positive change.

Mom's Career: "I've Known so Much About Teaching Because of My Mom."

Although Christy had not considered a teaching career until she was accepted to the NCTFP, Christy had seen her mom work as an educator throughout her life:

I've known so much about teaching because of my mom and her coming home and grading...and talking about different things that she goes through in the schools. I was able to get a background on why teachers are the way that they are...that was really great.

Christy's mother had been a Teaching Fellow in the original program, also receiving her degree at a public institution within the state. After teaching, Christy's mom pursued a degree in school administration and became a school principal "to make a positive change" because of what she had experienced as a teacher. Christy's mother left her principal position in recent years, with an interest in running for office with teacher pay as "one of her main platforms." Christy says her attended "the Raleigh March that they had for teachers where they wear red." Christy says that part of her mom's encouragement for her to pursue education and the NCTFP comes from her optimism about coming changes for teachers:

[My mom] said, "Hey, there are going to be a lot of changes going on with teachers in the future...You'd benefit greatly in the industry, and especially for a technology teacher, there's always going to be a job for you with technology."

As a high school senior, Christy had seen some evidence of this herself through her participation in the North Carolina Page program

Our county had a person who was [in the NC General Assembly], so I went in to work with her and she was talking about how she was trying to help teachers. I was able to sit in on people working on different bills. One of them was working with teachers to expand their funding for the public schools here in North Carolina. So that was great.

NCTFP Experience: “Really, Really Fun for Me”

During her first semester in the NCTFP, Christy has been very active with the program on her campus, helping plan events and coordinate the Fellows. Through the NCTFP, Christy has heard from a number of former Teaching Fellows about “What they’re doing...how they’re teaching, how they’re learning.” One activity that Christy participated in was a lunch where Fellows on her campus met with “Senators and House of Representatives members who were coming in and talking to us about how they’re trying to help teachers”:

They were trying to tell us how they really wanted us to come over there and help, and just talk to them, and get to know our perspectives as undergraduates and things that we expect when we come out and start teaching in the world.

Christy says these activities haven’t changed the ideas she had about teaching, especially because she was familiar with the profession through her mom. In spite of her initial hesitation about teaching, Christy speaks enthusiastically about her experience and what’s to come:

It’s only my second semester in it, but I just can’t wait to see the other classes I have to take and learn more about it. That’s been really, really fun for me. I really just can’t wait to start teaching what I’m learning right now to other students and putting my own twist on it so that they will enjoy it as much as I do.

Future Plans: “Industries Focused on Technology and Design”

Christy has especially enjoyed the technology and design aspects of her academic program, skills that will prepare her for a career in technology if she decides to leave teaching:

If I decided that I didn’t want to teach anymore, I could go straight into the workforce in industries focused on technology and design or IT. Also, I can teach different subjects focused around STEM education.

Christy says she is “not really sure” about the specific subjects she will teach, although she lists drafting, information technology, video production, graphic design, and web design as potential options, classes similar to what she had taken and enjoyed in high school. Although Christy is open to teaching different subjects related to her licensure, Christy would prefer to work in a high school in comparison to other levels:

I think high school you can really, not influence [students’] decisions, but you can help them make them. Especially ninth grade, making sure that they get that solid foundation...Also, junior or senior year, helping them choose what they want to do, whether they even want to go to college, or if they just want to go straight into the workforce...I think that's why I'd really like to do high school.

Christy has identified several possible school systems she would consider working in, including one system near her hometown and two others close to her current institution.

Long-term, Christy doesn't see herself staying in North Carolina, nor necessarily staying in teaching. Yet, Christy is “very certain” that she will complete the NCTFP requirements and says she has “learned a lot” about the requirements since joining the program. Christy also feels knowledgeable about the differences between low- and high-performing schools, although this comes primarily from her exposure to different types of school environments through her mom's career:

At my high school, teachers could just print whatever, not really think about “What if we run out?” If they run out, they can just get more paper. [While working at a low-performing school], my mom was like, “I'm going to run to Staples real quick and grab some paper for our copy room” ...that came down to our family paying for supplies for the teachers at her school.

As part of the NCTFP, Christy has also heard speakers from different types of schools, which has helped her think about whether she will pursue teaching at a low-performing school. Christy is unsure of the type of school that she would most like to teaching, saying: “I’m in the middle right now, I know that I want to have opportunities with my students when it comes to technology, but I know that not everybody has those opportunities.”

Although she is unsure of the type of school she will teach at, Christy is leaning towards teaching in a low-performing school to complete her required service more quickly, especially since she would like to move out of state which she says is “really just [her] only goal right now.” Christy also sees the potential for making a bigger difference at a low-performing school: “I think for me, giving my services to a low-performing school is going to be better just for helping out the school, the community that school is in, helping out the students because that’s the reason why we’re here.” Christy is not worried about the length of the teaching service commitment, commenting that her four years of high school went by really fast, and she expects her time in college, and in teaching, to go similarly quickly.

Once she moves out of state, Christy could see herself either continuing a career in teaching or pursuing a career in technology, especially if she moves near her family who have a business in the technology field. This summer, Christy will be interning at the company:

There are so many opportunities for me in [the Midwest]. Even if I don’t find what I need, I always have my family...The company that they have is with technology and cybersecurity, so I could always go into that with them or find my own path.

Regardless, Christy looks forward to continuing to gain experience in education, hoping to potentially intern at the science and technology museum she visited as a child and to visit more schools “to see what [she] would like to do, and what [she] could do.”

Zoe

Early Interests: “I Was One of Those Kids That Did Well in School”

In recounting her history, Zoe describes a very positive educational experience, with the first event on her timeline occurring in third grade. At this time, Zoe had gotten in trouble in school “for the first time” for not doing her work. Zoe recalls wondering, “Why do I need to do my homework if I already know what I’m doing?” Zoe “was always good at school things” and in fifth grade she received a perfect score on a statewide end-of-grade test. When asked why these early experiences stood out, Zoe says:

I was one of those kids that did well in school. I think that has a lot to do with it. I was like, “Well, if I’m good at it, I want everyone else to be good at it so I’m not alone. I don’t want to see people struggle.”

Family: “They’re All Helping People, I Want to Help People”

Despite her educational success, Zoe initially “did not want to be a teacher.” From an early age, Zoe saw herself teaching, but as more of a way to support herself financially while she pursued creative work rather than as a primary goal:

My grandma is a writer, so at first I was like, “I’m going to be a writer. I’m going to do something creative.” Then I started to realize that she didn’t start out as a writer, you have to have a real job for a bit and then you can do your creative stuff...I can’t just sit here and write all day when I actually have to pay bills. That’s what my family told me. I thought about it then and I was like, “If I teach, I can write and teach at the same time.”

Throughout her life, the career paths of Zoe’s family members played an important role in her own interests and decisions. One of the reasons that Zoe began to think about teaching was the experience of her family members, several of whom were in education:

Everyone in my family has worked for one school or another in some way, shape, or form. My mom's at [institution], my grandma was at [institution], my grandpa was in [school system]. I was like, "Well, they're all helping people, I want to help people." Zoe's grandfather, a former middle school science teacher, was particularly influential to her exposure to teaching. In ninth grade, Zoe helped her grandfather study to renew his National Board Certification. Zoe also helped her grandfather prepare for his classes; she recalls helping him make rain barrels and spending time in his classroom interacting with his current and former students. The retirement of Zoe's grandfather also played a role in her interest in teaching: "I was like, 'My grandpa's a teacher, that's good enough.' But then I realized he had to retire soon...I was like, 'Oh, no. Well, if he's going to retire, then I guess I can step up.'"

Science: "It Was Never Really My Thing"

Throughout her education, Zoe most enjoyed language arts and social studies and she planned to become a teacher in one of these subjects. However, Zoe also performed well in science and math and was surrounded by family members interested in science. Zoe's grandfather was a marine biologist before he had become a middle school science teacher and her mother studied biology while in college. Zoe says, "There were a lot of science books and science things in the house...I think that's how I got good at it, but it was never really my thing. I think it might be genetics that I'm good at it." Zoe also describes having a science teacher in seventh grade who was memorable for being "animated," "bubbly," and "interesting," a personality contrasting Zoe's experiences with other teachers. Despite enjoying this teacher and the class, however, Zoe was still uninterested in entering science or in teaching science herself.

Teacher Support Programs: "If I Do Science, I Can Get the Money"

As a North Carolina native, Zoe had first heard about the original NCTFP through her grandfather's former students while growing up. Zoe also learned about the original program

through the College Foundation of North Carolina (CFNC), a public educational and career planning website with information about applying to and paying for college: “When you’re in middle school, you first make your CFNC account...I think it was 2010, so [information for the old NCTFP] was on the website... I was like, ‘Oh, that’s neat.’” Years later, Zoe revisited the CFNC website in search of information about another teacher support program:

I was in the tenth grade and we had a ceremony that the seniors go to, and they go through all their scholarships...My dental hygienist’s daughter got an award to be a Future Teacher. I saw it and I was like, “Oh, that seems cool.” I looked into what you had to do to get a Future Teacher scholarship [on the CFNC website] and when I was looking into that, I saw all the rest of the North Carolina teaching scholarships.

Zoe ended up applying to the Future Teachers program at her school system, a program that admitted high school students planning to pursue education majors and careers, and that provided college funding in return for students’ commitments to return to the school system to teach for at least three years after their college graduation.

From the CFNC site, Zoe also learned that the NCTFP was back. Zoe was interested in the NCTFP based on the program’s financial support, the opportunity for “extra teacher development,” a “support network,” and the focus on “low-income schools.” However, participating in the NCTFP would mean changing the subject she would prepare to teach:

Up until last year I wanted to [teach] language arts/social studies. I’ve always been good at math and science, but I do not like it ...I wanted to do English or social studies, but I was like, “If I do science, which I’m good at, then I can get the money to get through school, and then later I can go back and get certified to do social studies.” I was like, “Three years or five years of teaching science is not that bad if I’m considered good at it.”

The Future Teachers Program Zoe applied to was open to teachers of all licensure areas, including language arts and social studies. Thus, while the NCTFP aligned with the Future Teachers Program in the types of schools she could teach at to meet her service requirements for both programs, the subject area requirement for the NCTFP led her to pursue licensure in science education: “I was just like, ‘Well, to get this one, I have to do this.’” Zoe says “I probably would have stuck with social studies if I could have. But I think it was for the better. I think since I’m so good at science, maybe that’s what I was supposed to do in the first place.”

Zoe decided to become a middle school science teacher, a decision based on her desire to help students at a critical time in their education, and insight from family:

I’m going to do middle school teaching, which, everyone’s like, “You’re crazy for that one.” But my mommy always told me that seventh grade is a very pivotal year, especially for girls. It’s either the year they love math or the year they start to hate math...Even though I don’t love [math], I knew I had to do it just to prevent kids from hating school as they get older.

For Zoe, teaching middle school was an opportunity to help students succeed at a time that she thought they may need it most.

College Choice: “Closing the Private School Gap”

Zoe applied to three North Carolina colleges, including two NCTFP partner institutions (one public, one private). The institution she ultimately chose, a private institution, had been of interest due to its proximity to Zoe’s home, her mom’s encouragement for her to consider the institution, and because several of her respected high school peers and teachers had attended the institution. Zoe remembers thinking, “The smart students are going there, let me see what it’s about.” When she researched the school, Zoe says, “The first thing that popped up was that 100% of the people who got their teaching license from here got a job. I said, ‘That sounds

delightful.” Zoe liked the institution’s education program and was impressed to learn that the school has maintained its own private Teaching Fellows program in the absence of the state’s program: “I was like, ‘Oh, so they can stay strong this whole time with their own teaching goals... They must have some roots.’” Zoe applied to the private Teaching Fellows program as well.

Although Zoe’s mom had encouraged her to attend this institution as she was growing up, her mom “switched as [she] got older,” later encouraging Zoe to attend a public institution instead: “She was seeing that private school price tag. I looked at her and I said, ‘I’m not paying for college. We’re not paying for it out of pocket.’ And then I didn’t have to.” By April 2018, Zoe had received admission to all three institutions and to all three teacher support programs that she had applied to, culminating in “enough scholarships to attend [institution] as a full ride, almost.” Although Zoe had received comparable financial support for the two NCTFP partner institutions, the higher tuition at the private institution left a gap between the costs of the two options. Zoe knew that she “had enough money” to go to the public institution, but “not quite enough money to go to [the private institution].” With impending deadlines, Zoe was forced to choose a college before her financial aid was confirmed, ultimately selecting the private institution based on her interest in their education program. Fortunately, Zoe later received additional scholarships to “close the private school gap” and the decision worked out.

Future Plans: “I Want to Get into a School Where I Can Start Something”

Zoe is “very certain” she will meet all program requirements for the NCTFP. In our first interview, Zoe was unsure of exactly how many years of service the program required, suggesting that it may be three or five (her Future Teachers Program requires three years of post-graduate service). Still, she is confident in her ability to complete the requirements and plans to do so at a low-income school, which she herself attended while growing up:

I found out that every school that I attended growing up was low-income, and I had no idea. I was like, “So, you’re telling me those schools are struggling? What does low-income really mean?” I was like, “Oh, low-income schools aren’t that low. You would think they would be down in the dumps, but they’re not that bad to be considered low-income.” That’s what I wanted to do anyways, was to help the people that needed help the most. This kind of forces me into a low-income school, which was what I wanted anyways. So, I was like, “Yeah, that’s good.”

Zoe has identified two potential schools of interest that she believes will fulfill her service requirements for both NCTFP and Future Teachers Program. Zoe notes that these schools are missing programs like Science Olympiad (which she is familiar with through her own middle school experience, and because her grandfather formerly coached a Science Olympiad team), initiatives that she would like to bring to these schools.

I looked these the two schools Zoe mentioned up after our first interview, noticing that only one of the schools met the NCTFP’s definition of low-performing. In our second interview, I brought this up, leading to a larger conversation about the NCTFP and Zoe’s goals. Zoe says she had not realized the NCTFP incentivizes *low-performing* schools instead of *low-income* schools, but this information doesn’t necessarily change her goals—she is “happy to go anywhere that needs any kind of help.” Zoe is especially interested in teaching at a low-income school because this is how her education started and she feels that these schools are where resources, programs, and good teachers, are most needed. Zoe says, “I want to get into a school where I can start something...I don’t want to go to a school that’s already got it all figured out.”

As she looks ahead, Zoe expresses no concern about her ability to teach successfully. Zoe works at several YMCAs and frequently interacts with elementary and middle school students. Zoe also volunteers in schools as part of the community service requirements with the Teaching

Fellows program on her campus. She calls the middle school students “loud,” “rambunctious,” and “fun.” Zoe’s experience watching middle school students in her grandfather’s classroom has also built her confidence for working with this age group.

Long-term, Zoe is less sure of her plans. As a high school student, Zoe participated in the North Carolina Governor’s Page program and she is interested in returning to the office as an intern. Zoe plans to double major in political science and is interested in policy. Just a few years ago, Zoe’s “biggest goal” was to be Secretary of Education. However, Zoe sees teaching experience as critical to this career interest:

If I was going to be in education policy, I wanted to teach first because I feel like there are a lot of people in education policy that have never stepped foot in the classroom, have no idea what’s going on other than what they see when they go visit. But I’m like, “When you go visit, those kids have been told to be on their P’s and Q’s. You don’t know what happens when you leave.”

Zoe anticipates staying in teaching “as long as [she] see[s] the need.” Consistent with her original subject interests, Zoe could see herself getting licensure in another subject area once she completes her NCTFP requirements in science: “I’ll probably end up going back to get multiple [licensures] ... to do social studies, maybe even math if I feel the need.” Looking longer term, Zoe says, “I would love to do School Board... walk the line between politics and education, then maybe work my way up, or find a place that I’m happy with and just stay there.”

Jenna

Family: “They Support Me in Everything”

Jenna completed her timeline in advance of our interview and began her explanation by acknowledging her family: “I started with the fact that I was born into a supportive family, because I think that’s number one.... they support me in everything that I do, and they encourage

me to go for what I want.” Jenna’s parents had not attended college themselves and, as a result, had encouraged her to go ever since she was little: “[My mom] was like, ‘You’re going to college.’ I was like, ‘Okay.’” Although neither of Jenna’s parents are teachers, a number of her extended family members are, including several aunts and cousins.

Early Interests: “I’ve Always Wanted to be a Teacher”

Jenna describes an interest in school from a young age, due in part to “all the great teachers that [she] had.” Jenna says, “I fell in love with school during elementary school” and often remembers playing school with her friends. Jenna says, “I’ve always wanted to be a teacher. That’s just a fact.” Throughout school, Jenna “loved math” and “figured out that math is one of [her] passions” in middle school. Jenna especially liked seventh-grade math, describing hands-on activities that her teacher often led:

I think people find math boring, because when they think of it, they hear, “Oh, you just answer questions out of a textbook” ...But it’s teachers who do the hands-on stuff that make it interesting. I want to bring that to my classroom, wherever I am.

Although Jenna grew up wanting to become a teacher, she took CTE courses in high school in subjects like “culinary arts, health science, and interior design” to confirm her interests:

I always knew I wanted to be a teacher, but I wanted to solidify that before I chose my college or dedicated myself to education. I knew for a fact that that’s what I wanted to do but I don’t want to waste my time in college, because it’s a lot of money.

Jenna says her mom was especially encouraging of this, wanting Jenna to be sure of her interest in teaching before spending money on college: “[My parents] were going to help me pay for college, so they didn’t want to pay for three extra years for me to change my major 1,000 times.”

As part of her health sciences class, Jenna got involved in a competition-based student organization. While Jenna was not interested in a career in health sciences, one of her teachers

had recommended that she get involved based on her academic performance. Jenna found herself enjoying the problem-solving tasks and took on leadership positions within the club. Jenna's team succeeded in local and state competitions, even advancing to an international competition where Jenna helped present the team's work in front of judges. Although the team did not place within the competition, Jenna remembers the judges saying to her: "'You really captivated us in your speech. Have you ever thought of being a teacher?'" I was like, 'I have.' After that, I was like, 'I know this is what I want to do.'" During her senior year, Jenna "helped found the Future Teachers of America Club" at her high school. Through the organization, Jenna taught lessons in a local school and heard a visiting senator "talk about what it's like to be a teacher in North Carolina."

College Choice: "You Can Get into Clinicals Freshman Year"

As she considered colleges, Jenna applied to four public institutions in North Carolina and was admitted to three. Jenna visited her current institution for an Admitted Students Day, where she met education advisors and learned that first-year students at the institution spend time in a classroom during their first year: "The thing that made me choose [institution] was that you can get into clinicals your freshman year. We went and visited classrooms freshman year. At other schools, you have to wait until your junior year."

Middle Grades Math: "I Didn't Even Know That Was a Thing"

Although Jenna knew she wanted to be a teacher and was most interested in math, she was unsure whether she wanted to become a math teacher. Jenna was specifically intimidated by the coursework required for a math major. Instead, she selected history:

I came into college as a history major with a secondary [education] minor... I like math, but if you're a secondary [education] minor, you major in math. I would have to take up

to Calculus IV. I was like, “I can't pass that” ...I was like, “Okay, well, history’s my second passion.”

Although Jenna liked history, she also attributes this choice to her former teacher: “My favorite teacher was a high school history teacher, and I wanted to be like her.”

During college orientation, Jenna reconsidered this decision. Jenna had hoped to live in the institution’s education-themed living learning community (LLC), in which participating first-year education students live and take classes together: “It’s basically like you have built-in friends.” However, majoring in history would have precluded her eligibility for the LLC:

I was like, “This isn’t for me. I’m going to go back to math.” I went and talked to an advisor in the education department and they were like, “Well, you could always try middle grades.” I didn’t even know that was a thing. I was like, “Yeah, I want to do that.”

Jenna began preparing to become a middle school teacher, majoring in education and selecting concentrations in math and history. In her first year, Jenna had an opportunity to observe elementary, middle, and high school classrooms, which helped confirm her plan: “When we went to a high school, I was like, ‘I was just here last year. I don't feel older than these kids...That’s pretty much when middle school came to me.’” Jenna also had “love[d] middle school math” and was looking forward to teaching the topics covered in middle grades math.

Financing College: “I Applied to as Many Scholarships as I Could”

Sensitive to the cost of college, Jenna has very actively sought opportunities for funding: “I don't have \$80,000 laying around in my pocket, so I [applied to] as many scholarships as I could...especially the education ones.” While a first-year student, Jenna used her institution’s website as a primary source for scholarships: “I pretty much applied for everything that applied to me ...I got a bunch of little [scholarships], like \$500, like \$1,000. They don’t really take a whole lot off, but it’s something.” Since beginning as an education major, however, Jenna has

checked this site less often and instead often receives emails about opportunities from a listserv sent to education students at her institution. Jenna has learned about several opportunities from these emails, including a one-year program she currently participates in, the North Carolina Space Grant program for STEM education majors across the state, as well as the NCTFP.

Although Jenna “had heard of the old Teaching Fellows program,” she didn’t know much about it beyond that it “went away and had been away for a while.” Jenna also remembers that her second-grade teacher was a Teaching Fellow, although she can’t recall how she learned this. Jenna first received information about the NCTFP via her education program’s email listserv:

[The NCTFP] was just thrown on us last minute. [Institution] found out that they were one of the schools last minute...I got the email...I had like a week to get my high school transcripts and my college transcripts. It was crazy. I got it all in in time, thank goodness.

Beyond the funding it would provide, the NCTFP stood out to Jenna for its focus on STEM and special education and for the opportunity to participate in a community of people with shared career interests:

[The money] was not the only reason I applied...It’s a cool opportunity to be able to network with current Teaching Fellows, ones that are in the field already from the past program, and then future ones, ones behind us, they come to us.

After Jenna was accepted into the NCTFP, her second-grade teacher saw her name on the list of new Fellows and reached out: “He was like, ‘This is so cool. I’m a Teaching Fellow, class of ‘80,’ or something like that. I thought that was really cool that he remembered who I was.”

Like in high school, Jenna has been actively involved while in college. Because she changed her major to middle grades education, Jenna was able to participate in the education LLC her first year, where she “met most of [her] current friends,” and is now a mentor in the program. Jenna has also been involved in the Student North Carolina Association of Educators

organization, recently assuming a leadership position. Jenna also has a paid job helping recruit prospective students to the education school. To continue her professional development and to make additional money, Jenna spent last summer working at an engineering summer camp near her home that offered week-long camps for “at-risk” kids, an experience that she says was “so much fun” and that she hopes to do again this summer.

Future Plans: “I’m Only Getting the Scholarship for this Year and Next”

When asked how well she understands the requirements for the NCTFP, Jenna responds: “Not entirely well to be honest. I recently found out I’m only getting the scholarship for this year and next because I’m technically considered a transfer student because I was already in the college when I applied for it.” Jenna had expected to get the scholarship for her three remaining undergraduate years. Jenna learned about this very recently through her Teaching Fellows seminar, when the program director had brought it up. Jenna describes that other students were surprised as well and that her mom “wasn’t too happy” to learn this information. Jenna continues to look out for other funding opportunities and is applying to a funding program for STEM education students at her institution, which would provide larger forgivable loans for her junior and senior years in exchange for teaching at a school in a low-income district for four years.

Jenna understands that for her two years of NCTFP funding received, she is committing to two years of service at a low-performing school in the state, or four years of teaching at a school not considered to be low-performing. Although Jenna had indicated that she does plan to teach in a low-performing school in her initial interest survey for this study, when asked about her plans, Jenna says, “I’m not sure yet, because I don’t exactly know what that means. I feel like I should, but I don’t.” By the time she reaches student teaching, Jenna expects to have experienced urban, suburban, and rural schools and anticipates having better insight into different school types as she progresses through her program. At this point, Jenna “doesn’t really

have a preference,” for the type of school she will end up working at, although she knows it is common for students to receive jobs from the schools where they student teach: “If I like the school, and they offer me a job, I might as well [stay].” Overall, Jenna isn’t worried about meeting the NCTFP service requirements since she “plan[s] to teach for well more than four years after graduation” and would have met the teaching service requirements regardless.

When looking further into her future, Jenna’s “ultimate dream” is to get her doctorate: “I don't want to stay in middle school my entire teaching career. I think I eventually want to move up and be a professor.” Jenna would also like to pursue her master’s degree after she completes her bachelor’s and knows of a program at her institution that would allow her to do this: “[Institution] does this program where you can go out and teach and take night classes and do your grad school that way.” Jenna says, “I guess that would add a concern to if I can get my teaching in for the Teaching Fellows requirement, but I don’t think that should be a problem. I definitely do want to further my education past undergrad.”

Matilda

Early Interests: “I Was Always the Teacher”

Matilda begins her timeline with memories of playing school with her younger sister: “I was always the teacher, she was always the student ...I feel like a lot of kids did that, but I really liked it.” Matilda describes her childhood career ideas as somewhat unusual, suggesting that while many children have creative or nonsensical career ideas, her goals have always been practical: “I was like, ‘I want to be a lawyer. I want to be an editor.’ The farthest out there I got was novelist... I picked kind of boring careers.”

Chemistry: “The One Subject That I Had to Work At”

While no specific experiences stood out from Matilda’s elementary or middle school years, Matilda’s experiences in high school were especially influential to her career ideas and

goals. As a sophomore, Matilda took chemistry, a class that she enjoyed because she worked hard to earn her success independently: “Chemistry was the one subject that I had to work at because my parents are both really smart, but they were both really bad at chemistry, so they couldn’t help me.” Matilda’s mother is a pediatrician and her father is a lawyer: “My family is so smart, it’s honestly annoying sometimes.” When Matilda found that she was skilled in chemistry, meeting her “perfectionist” standards with limited resources, the memory stuck. Looking back, Matilda sees this course, and this dynamic with her parents, as critical to her interest in the subject: “If my mom had been really good at her chemistry course in medical school and could help me do my chemistry homework...I might still be going into teaching, but I don't think that it would be chemistry.”

Although Matilda’s success in chemistry was a point of pride, she was generally more involved and interested in music, especially in chorus and theater. As a result, Matilda was also considering a career as a high school chorus teacher. In addition to her interest in teaching from a young age, Matilda had observed her own teachers, admiring the good teachers: “Man, I want to be like that,” and motivated to do better than the bad teachers: “I could do better than that...‘I knew that if I were in their place, I would want to help my students more.’”

Teaching: “Maybe I Should Go into a More Stable Career”

During her senior year, Matilda became especially aware of socioeconomic dynamics related to teaching careers, especially within North Carolina. One of Matilda’s teachers was “really politically active” and the class often discussed current events, including the Red for Ed public education movement that “really took up steam in [her] school,” an initiative led by Matilda’s teacher. Although this teacher was a former Teaching Fellow herself, Matilda didn’t know it at the time. As a senior, Matilda wrote a paper about the economics of her own college and career plans, focusing on her plans to be a teacher: “We had to look up facts. I looked up the

average teacher salary in North Carolina...that's when I was starting to be like, 'Maybe I shouldn't do this. Maybe I should go into a more stable career.'" Matilda explains further:

I knew that teachers didn't get paid a lot and I knew that in terms of job stability and state funding, arts programs were the first that got cut... I was afraid that I was going to get my job cut if I went into arts education. Then I didn't know what I was going to do.

As she was thinking about these issues, Matilda regularly heard concerns from others regarding her interest in teaching. These concerns took two primary forms: the economics of becoming a teacher, particularly the lack of job security in arts education and low teacher pay, and concern about Matilda becoming a teacher in spite of her intelligence. Although Matilda's parents supported her interest in teaching, her grandmother was less supportive:

I think she's convinced that I'm really smart and I think she wanted me to do something challenging. She pushed brain surgeon for a while...and then she pushed lawyer...I think she's happier now that I'm a chemistry teacher, but she was very worried about me being an arts teacher... She never said it out loud, but I think that she was a little ... Just, why am I doing this? I'm smarter than this, basically.

While Matilda's grandmother never explicitly made these comments, others did: "I've had people ask my mom, 'Are you okay with her doing that? Why are you letting her become a teacher?' ... People will tell me, 'Wow, you're not going to make a lot of money.'" Matilda says it feels "kind of weird" to be pursuing a career that doesn't "get the most respect in American society," especially compared to the careers of her parents and sister: doctor, lawyer, and (future) nurse, respectively.

Still, these comments did not deter Matilda's interests. Instead Matilda wonders why smart people would be discouraged from entering teaching given how important these jobs are to

students today. Matilda suspects that part of the reason that these comments haven't deterred her from teaching may be her family's financial resources:

If I had come from a different background, it might be more about "What am I going to do to be able to support myself, the money aspect of it?" But, my parents are really well off, so they're like, "Do what makes you happy, that's the most important thing." I know that teaching makes me feel really happy... [Others] are not telling me anything new.

Major Choice: "What Can I Do That's Fun-ish and Will Make Me Money?"

When it came time to apply to colleges, Matilda applied to four institutions, applying to music education programs at three institutions and to a chemistry program at the fourth. Three institutions were public institutions in North Carolina, and another was a selective out-of-state private institution that her parents had both attended, to which she was waitlisted. Matilda's college plans changed during her senior year and, by the time she chose an institution, Matilda was no longer planning to study music education. Due to her uncertainty in an academic major, Matilda choose an in-state public institution that would give her "flexibility" to explore options through general education requirements.

With her interest and success in chemistry still in mind, Matilda entered college and changed her academic program to pre-pharmacy during her freshman orientation. This decision was a result of wondering: "What can I do that's fun-ish and has chemistry in it and will make me money?" Matilda's mom had suggested pharmacy, a career also held by a friend's father. However, Matilda quickly realized that she hadn't entered college with sufficient AP credits to complete the program in four years. Still, Matilda took pre-requisite courses: "My mom was like... 'At least take some of the pre-reqs in your freshman year while you find something to do.' I took Biology and Calculus I, just in case." During this semester, however, Matilda says "I decided that [pre-pharmacy] was way too hard...I was like, 'I don't care about money. I'm going

to be a drama teacher.” Matilda had gotten involved in theater at the institution and, due to the significant commitment of being involved with theater, she had been discouraged from majoring in chemistry. However, after her first semester went well academically, Matilda became more confident in her ability to pursue chemistry while staying involved: “Second semester, I was like, ‘I want to be a chemistry teacher’”: “I was in Chemistry 102...I was like, ‘I like this...I still like chemistry... I can just major in chemistry.’”

NCTFP: “I’m STEM, So I Should Try It”

Matilda remembers first learning about the new NCTFP from Facebook: “It was either a sponsored ad or the [education school] shared it, because I like [them] on Facebook.” Matilda remembers telling her mom about the program:

I had heard of it before and I knew that it was a thing and then I kind of knew that it wasn’t a thing anymore. I talked to my mom about it and she was like, “Oh, they got rid of that...they must have brought it back.” I looked at it and it’s STEM and special ed only and I was like, “Well, I’m STEM, so I should try it.”

Matilda was somewhat familiar with the old program, learning from her mom that her former high school teacher had been a Teaching Fellow: “I was like, ‘Oh, she’s a good person and a good teacher. Maybe I should apply, because she did it and she’s awesome.’” Matilda remembers seeing the NCTFP ad the day before the program’s deadline and applying “on the last day.” She recalls feeling like her application was “kind of a long shot”:

I knew that it was a cool thing and I knew they would give me some money...I was like, “Why not?”...For somebody whose parents have a lot of money, I am always stressed about money and I don’t know why...I’m aware that I have a lot of privilege, so it stresses me out to be like I’m taking advantage of my parents... it’s more of the pride aspect, I guess.

While the money was a primary incentive, Matilda explains that it wasn't the only reason she applied to the NCTFP, especially because she didn't know how much funding she would be eligible for. Although she was aware of the maximum award amount, Matilda was thought the funding may be awarded differentially: "I assumed that they were going to give it on a scale...the top applicants get the maximum award and it would go down. I don't know what other people got. They gave me all of it."

In addition to the financial support, Matilda was also drawn to the program's reputation, anticipating that it would help her competitiveness for jobs in the future:

I'm terrified I'm not going to get a job after I graduate... we all are at this age. I was like, "If I get this, it'll look really good on my resume and maybe people will be like, 'Oh, she's a Teaching Fellow... we should give her a job because she has a lot of experience.'"

Ultimately, Matilda was surprised that she got in to the program: "I really didn't think I was even going to get an interview and then I got it...and then they gave me a lot of money... I really was shocked." Matilda explains that she thought the program may prioritize high school or college graduate applicants who would either create an inaugural cohort or require only one year of funding, respectively. Matilda was also afraid the program would be very competitive: "I think the college admissions mindset tells you that you have to cure cancer or save a private island to get anything. So, I was like, 'I didn't do enough, I don't know if I'll get it.'" Matilda also wonders whether the new status of the program influenced the acceptance process:

I'm trying not to downplay my accomplishments, because I know that I do that sometimes. Part of me thinks that it was just because it was the first year and they didn't get a lot of people applying, but also, I know it is a big deal.

Teacher Preparation: “I Am Definitely Getting Better”

Thus far, Matilda has learned a lot about teaching and feels her institution “is doing a good job preparing [her]” for the career. Matilda says that class discussions about concepts such as culturally relevant pedagogy, teaching methods and communication, state standards, and more have helped her gain a greater understanding about “how complex it is [to teach].” When asked about any concerns she has related to teaching, Matilda speaks primarily about classroom management. Matilda had a professor tell her she is “too nice” and she says she is, “very, very worried that I’m going to be too nice to my kids...and they’re going to walk all over me and not take me seriously.” Matilda says she is “still trying to get better at...see[ing] myself as an authority” but feels she is improving: “I am definitely getting better than I was as far as getting people to listen to me, being nice and fun, but still getting people to do what I tell them to do. That’s the hardest part for me.” Matilda feels the NCTFP has helped with this, as she has learned different teaching strategies from guest speakers and other activities through the program.

Low-Performing Schools: “I Don’t Know if I’m Good Enough”

Because she began in the program as a junior, Matilda is eligible for two years of funding from the NCTFP. To complete NCTFP service requirements based on her funding, Matilda will have to teach for either two years in a low-performing public school in North Carolina, or for four years in a public school not considered low-performing. When asked about whether she plans to teach at a low-performing school, Matilda is unsure:

The idea of working in a low performing school and helping kids that really need a positive role model and someone to help them in life, that is everything that I’m passionate about, but I just don’t know if I’m good enough to do it. I think I’ll find that out after I student teach. I know so many people that do it and then they get so stressed and burned out and they feel like they failed and then they leave. I know that another big

problem facing low-performing schools is the idea of revolving door teachers. They don't have teacher retention... I want to go do it and try it and help the kids, but I'm afraid that I won't do well. I'll leave. I'll be part of the problem, or even worse, I'll do my two years, get my money back, and then just disappear.

Matilda sees student teaching as one way to gain experience teaching in a low-performing school in order to evaluate fit before committing to a full-time position.

Future Plans: “There’s Nothing Else I Want to Do”

Matilda feels confident that she understands the NCTFP requirements, especially because she reviewed them with her dad, a lawyer, before she agreed to participate. Matilda considers herself “fairly certain” that she will meet requirements, only hesitating from saying “very certain” in case something unexpected comes up, joking about students “running her out”:

I don't think that will happen, but I don't know ...Even if I hated it, I would probably still keep doing it, because I don't like quitting things. I really try not to. But, like I said, I don't know what else I would do.

Matilda's parents have also offered to help if teaching doesn't work out: “My parents offered... ‘If you find out you hate it, we'll just pay back the money.’” I'm like, ‘No, you're not going to do that. First of all, that's expensive. Second, there's nothing else I want to do.’”

Matilda has early-affiliated with her institution's Master of Arts in Teaching program and will receive her teaching licensure within the master's program, although she will not receive NCTFP funding for the MAT year. Instead, Matilda says her advisors have offered to help her and other students find scholarships as needed for the master's year. The only NCTFP requirement that Matilda thinks she still needs to figure out is how to defer the start of her service in order to complete her master's coursework without penalty: “You're supposed to pay

it back as soon as you start but I'll just have to contact them and be like, 'Hey, I have one more year' so I can defer the payment on that."

Regardless of the NCTFP, Matilda thinks she would have chosen to teach in North Carolina immediately after her MAT graduation, due primarily to wanting to be near family:

North Carolina pays you like 0.1 dollars to teach, but I was going to stay here anyway...I'm very close to my family...I knew that after I graduated, I was probably going to stay in North Carolina for a short period of time. I was like, "Well, if I do [the NCTFP], then at least I have a commitment period." Four years max of being in North Carolina and that's good for me... The fact that you have to stay in a North Carolina public school, that didn't deter me.

Matilda goes on to point out a several problems with the state's education system and its support of teachers. Matilda is especially disappointed that the state does not offer additional pay to teachers with master's degrees and, as a result, she sees herself moving out of state long-term: "The one thing that gets me about North Carolina and the reason I'm going to leave... is North Carolina doesn't have master's pay for teachers anymore. They got rid of it in like 2012 or something." Matilda would like to move to a state that offers this benefit: "I know there are other places that will be like, 'You went and got an additional higher degree, specifically in teaching. You are worth more than this.'" Matilda says she would "definitely" stay in North Carolina if the state offered incentive pay for teachers with master's degrees.

Kristen

Mom in Teaching: "I Always Had That Presence in my Life"

In considering her path to teaching, Kristen first mentions her mom: "My mom's an educator...I always had that presence in my life." Kristen's mom completed her undergraduate degree in elementary education and then spent 20 years as a pharmaceutical representative,

working part-time once she had children. When the company laid off part-time workers, Kristen's mom, who had also been working as a substitute teacher, got a teaching job at the school Kristen and her brother were attending. Kristen was in fifth grade at the time and remembers enjoying "watching her go into teaching and absolutely loving it." Kristen's mom has since received two master's degrees and currently works as a guidance counselor, a job she loves "the same, if not more" than she did teaching.

Although her mom's experience in teaching was most directly influential to Kristen, Kristen describes coming from "a teacher family" and lists six extended family members who are working, have worked, or who are going to work in the profession: "When I was younger it was what I was surrounded by and was always drawn to." Despite this background, however, Kristen says there was "no pressure" for her to become a teacher, and that her mom would talk with her about it only because Kristen expressed interest in the profession: "Essentially, she was like a college guidance counselor at home, where she just gave me suggestions based on my skills, not based on what she wanted."

Teaching: "It Was Always in the Back of my Mind"

Kristen details diverse early career interests in her timeline, including "tow truck driver," "vet," "architect," and "civil engineer," although every idea also ends with "...or teacher." Kristen explains that teaching was the one consistent idea she held over time: "It was always in the back of my mind, it was always a possibility for me."

One alternative career idea that stuck with Kristen "for most of [her] life" was being an architect. Part of the reason this career interested Kristen was that she liked math: "I loved math... That's what I liked about architecture, I love building LEGOs, that's all math, kind of. When you draw a blueprint, it's numbers, figuring things out, it's all part of math." Although Kristen says she has "no idea" where this idea originally came from, becoming an architect

became her career goal until ninth grade, when she says, “My Geometry teacher told me I could never be [an architect] because I’m not great at geometry. So, that dream died there.” At the time, Kristen’s brother was applying to college and Kristen became additionally deterred once she learned that she would need a portfolio to apply to architecture school: “I had nothing... I’m not an artistic person... I was like, ‘Maybe she’s right,’ so I moved on with that.”

Despite this experience, Kristen continued to like math and even considered becoming a civil engineer, which she suspects was inspired by her older brother’s decision to study environmental engineering: “I was kind of interested in engineering when he started doing that, so after my teacher was like, ‘Don’t be an architect,’ I was like, ‘Okay we’ll go with engineering’...because that was kind of math, puzzles, very similar.” Kristen says, “When I was applying to colleges I sat there and I was like, ‘Well, I’m between engineering and teaching.’ Everyone was like, ‘Are you okay?’ Because they were just very different.”

Choosing Teaching: “It’s Always Been Math”

In high school, Kristen spent time leading a youth group at her church and often talked to her mom about this experience:

I would talk to my mom about that a lot from the education standpoint, not like “Yeah, the kids and I had a lot of fun,” but more of, “What they were learning and why we should teach it that way.” More of the actual pedagogy of it.

Kristen compared this experience to the way she was thinking about engineering: “I [didn’t] talk about engineering with anyone, but I never wanted to. I was more interested in talking about education.” Ultimately, Kristen chose teaching.

Even as she was weighed career ideas, Kristen “always knew” that math would be an important part of her path: “I was good at math and I liked it. For me, it’s always been math. That was never the question.” Although Kristen’s elementary school memories are limited, she

remembers her third grade math teacher as one of her favorite teachers. From an early age, Kristen performed better in math than in other subjects.

When Kristen was young, she had been diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD). Kristen began taking medication for ADHD in seventh grade, a time when things began to change for her:

I got to seventh grade and took Pre-Algebra and loved it. That was also the year that I started being medicated. But I loved it before too... That was my highest grade, I just enjoyed it so much and I really liked that teacher too, which helped a lot.

By eighth grade, Kristen was doing well in math: “I was so bored, I was three or four chapters ahead of the class. I just sat there and taught it to myself.” Kristen cycled between grade-level and advanced math classes after this point. Each time she was bumped up, however, she would realize that she missed a unit that other advanced students had covered in prior years. As a result, when she placed into honors geometry, Kristen’s teacher recommended she drop the class. Kristen opted to stay, although she “struggled through the class.” This teacher had been the one to tell Kristen she “shouldn’t be an architect.” The next two years of math went well for Kristen: “I took Algebra 1 and then Pre-Calculus, loved both teachers, did really well, it was great.” Then, Kristen had the same teacher for her Calculus class that she’d had for Geometry and, again, it didn’t go well, Kristen also took a class in Problem Solving as a high school senior, a class that she really enjoyed: “I love that part of math, of kind of the weird quirks... problem solving is kind of my specialty with anything.”

College Choice: “I Really Had No Idea What I Wanted”

When it came time to consider colleges, Kristen was unsure of the type of school she would go to because her grades “weren’t super great in high school,” and because scholarships were also important to her decision. Kristen applied to “13 different schools” ranging in type and

location: “I really had no idea what I wanted...so I just applied to a bunch of them.” Much of Kristen’s exposure to these institutions came from college representatives visiting her high school. Although Kristen was originally interested in a large institution with a major athletic program, the representatives from the large institutions had crowds of students talking to them and “had no idea who [she] was.” By contrast, one of the small private institutions that she was considering had only three students from her high school who were interested: “[The representative] would see me around campus and know who I was.” Kristen says:

I was talking to my mom one day about how...I really want to go to those big schools, but I wish those reps were more like the small private schools.” My mom was like, “Maybe you want to go to a small private school then.” I was like, “Oh shit, you’re right.” That was November of my senior year of high school.

Kristen whittled her list down to two small private institutions, one in North Carolina and one in another state. Kristen ultimately chose the North Carolina institution due largely to the institution’s private Teaching Fellows program. Kristen had “stumbled” upon the information for the private Teaching Fellows program while searching for scholarships and decided to apply: “I was like, ‘If they’re going to give me money, why not, I’ll apply.’”

Middle Grades: “My End Goal is to Be Able to Bring My Classroom Outdoors”

Kristen entered college planning to prepare for a career in high school math although her mom questioned this decision: “When I started applying to colleges, my mom...would say, ‘Are you sure you want to do that?’” By the end of her first year of college, Kristen changed her mind, instead considering either middle grades or elementary education:

I was so scared about talking to [my parents] about changing my major...I’d been so sure I wanted to do high school math...and my mom was saying, “I don’t know if that’s what you want to do.” It was more of like, “Damn it, you were right.”

To make this decision, Kristen had gained classroom experience, volunteering at a third-grade classroom in her old school and conducting her first classroom placement in college in a fourth-grade class. Kristen says, “Great kids, loved working with them, did not want to teach them...And, I really did want the math aspect, I wasn’t interested in teaching social studies, and science, and English, that’s just not me.” Kristen also says, “I realiz[ed]...I don't want to teach Calculus and Pre-Calculus...I can do Calculus, but I like teaching Algebra better.” Teaching middle grades fit Kristen’s interests, and would also allow her to pursue a second major in experiential education, a combination of “experiential learning and outdoor education.” Kristen hopes to bridge these two interests in her future work as a math teacher: “My end goal is to be able to bring my classroom outdoors.”

NCTFP: “The Money Was Really Compelling”

As a current junior, Kristen was a college sophomore when the NCTFP was announced. Kristen was already involved in her institution’s private Teaching Fellows program and was still eligible for the NCTFP because, although she was taking education classes, she had not officially enrolled in the institution’s teacher preparation program, as this typically occurs in students’ junior year. Kristen says the NCTFP was advertised “throughout all of the education school,” although she first heard about it in a cohort meeting for the private Teaching Fellows program: “They just kind of mentioned it, and they mentioned money which, \$16,000, that was a huge attraction to me”:

I told my parents how much it was and they were like, “Yeah you’re applying to that.”

[The conversation] was about, “Hey this sounds good to me. I don’t know if I’m misreading some of this information, does this sound good to you guys too?” They looked into it and they were like, “Yeah you should do that.”

Kristen says, “The money was really compelling, I liked that I didn’t have to pay it back, that I could work to pay it back.” Kristen also liked the fact that the program would “look good” on her resume and job applications “when [she] applies to schools,” and that the program would “give [her] a concrete plan for after college.” Kristen says, “It helps me financially, I get to work, I know that I’ll pretty much almost positively have a job after college, I have to pay it off somehow. So, it just like, ‘This is great, sounds good.’”

Kristen’s Teaching Fellows experience to date has been characterized by the activities she’s participated in as part of the private Teaching Fellows program throughout her time in college. Of this program, she says: “It’s been great. I love it.” The highlight of her experience has been teaching abroad, her “first time student teaching” as, prior, she had only had the opportunity to observe classrooms. Kristen says, “I was with a sixth-grade, two eighth-grade, and a ninth-grade class, and I did math for all three.” Kristen describes this experience as “a confidence booster, almost of being like, ‘I’m able to do this.’”

Teaching in North Carolina: “I Need to Get the Experience Anyway”

Ultimately, Kristen would like to teach at her high school alma mater. However, because this is an International Baccalaureate (IB) school, Kristen says it is important for her to get teaching experience elsewhere first:

It’s a small private school. If I roll up right out of college and apply, they’re going to laugh in my face. Not really, but they are... I was like, “Well I need to get the experience anyway, probably going to do that in North Carolina because I’m going to be licensed here, why not get some money for it also?”

Although she is not from North Carolina, Kristen’s licensure will be in the state, a fact that she hadn’t considered when she originally chose to attend college out of state:

That was something that I really didn't think about...It wasn't like, "Oh, I need to plan right now where I want to teach after college." I ended up at the right place without worrying about it, but now I'm like, "Why was that not something I thought about?"

Many of Kristen's out-of-state classmates are also debating whether to stay in North Carolina, compelled in part by the prospect of helping to improve the public schools: "North Carolina public schools aren't the best, so we want to help that. We want to help improve them...we believe that our education at [institution] will give us the ability to help them."

Kristen has already made plans with a classmate who is also in the Teaching Fellows program to move to the same city within North Carolina and share an apartment. Currently, Kristen's plan is to "Do the four years [of NCTFP service], then teach abroad, and then go home." Kristen is also interested in the Peace Corps, which is what her brother is doing now: "I can push the four years [of NCTFP service] off to go to the Peace Corps, or I can do it afterwards." Kristen expresses some uncertainty as to whether she needs to start meeting her NCTFP requirements after graduation, but she and several peers have interpreted policy language to mean that they can defer service for graduate education and service programs like the Peace Corps.

When asked, Kristen isn't sure whether she will look for a job at a low-performing school, although she is leaning against it for now:

I've thought about it. For a while... I was like, "I want to be done with [the service requirements more quickly]." But [now] I want more experience. It just gives me time to relax and decide what I want to do. Also, not that I would limit myself being in a school for two years, but if I do a low-performing school, I just know for myself that I'll probably be like, "Okay my two years are up, I am able to do other things now, so then I'll look into other things." But I don't think that two years at one school is enough to

really understand the actual school itself. Four years sounds fun. Four years, I feel like, is a good amount of time.

Currently, Kristen plans to teach for four years in the state regardless of school type. Afterwards, Kristen will consider other options, eventually making her way back to her home town.

Kyle

Early Interests: “I Always Liked Technical Things”

Throughout his life, Kyle “always liked technical things.” Kyle attributes this, in part, to his father being “a big hands-on” person:

He’s always working on his car, or he’s working on my mom’s car, or he’s doing some sort of project involving wood, or landscaping or manual labor, where you get to build something. I’ve always really been interested in building things.

Growing up, Kyle remembers being curious about how things worked, and he mentions an example of “taking [an automatic card shuffler] apart and looking at the inside...and putting it back together and seeing if it worked.” Kyle says, “I’ve always been really interesting in doing stuff like that, but I never really knew how to classify it.”

While growing up, Kyle became interested in aerospace and engineering, especially because of the attention to advances in these fields. However, when he expressed this interest to his teachers, they discouraged the idea: “Whenever I would tell them that I wanted to do something, they told me I probably wouldn’t be able to do it.” Kyle says:

When I was [in middle school], I wanted to be a pilot for an airplane or a space ship...that was around the time that Elon Musk started getting big so I wanted to work with them, but [my teachers] were like “No, you’re too big and you have glasses so you can’t.” I was like, “Well, that sucks.”

After that, Kyle no longer considered a career as a pilot, although he continued to explore engineering. During Kyle's first year of high school he took an introductory engineering elective that he really enjoyed, a subject that "really sparked [his] interest." However, Kyle was unable to take the subsequent classes because his family moved:

The first high school that I went to had introduction to engineering...I only got to take the first one because I was there for only freshman year...but it was just an introduction to the general things that you do in engineering...they started working with AutoCAD and AutoCAD is one of my favorite softwares to work on, so I was like, "This is cool, this is what engineering is, I'm just going to be doing this."

Even though he was no longer taking engineering classes, Kyle "kept that engineering mindset" throughout high school and planned to study "aerospace or electrical engineering" in college.

College Choice: "The Best Opportunity and the Lowest Cost"

Kyle applied to engineering programs at four large public institutions, including one in North Carolina and three out of state. Although Kyle was admitted to all four institutions, he had only gotten into the engineering colleges at two of them. The cost of college was especially important to Kyle's decision: "I had to make a decision, which one gives me the best opportunity and the lowest cost?" Although Kyle had not been admitted to the engineering program at the North Carolina institution where he applied, he was admitted to the institution. The in-state tuition at this institution was especially compelling, as Kyle would "only [have] to take out \$4,000 or \$5,000 in loans" compared to the other institutions, where he would have "had to take out like \$20,000 in loans." Kyle says, "I just didn't want to do that." To save money, Kyle enrolled in the North Carolina institution knowing that if he did well academically, he would have a chance to enter engineering as a sophomore: "I was a little upset [that I wasn't admitted to

engineering] at first, but I was like, “Alright, I still have an opportunity to go into engineering, I just have to get in there and work and figure everything out there.”

Engineering: “I’m Not Enjoying It and Not Doing Well”

Although Kyle had taken AP Calculus in high school, he just missed the cutoff score that would have applied the AP exam towards his college credits. As a result, Kyle took Calculus I again during his first year of college and did well: “I think I got an A.” However, Kyle’s courses began to get more difficult his sophomore year: “When Calculus II came, I was like, ‘Whoa, I have no idea what I’m doing.’” A challenging exam at the start of Calculus II had Kyle rethinking his goals in engineering: “I just sat down and looked at my work. I had studied for like 20 hours...and I got a 45. I was like, ‘That’s not good.’” Kyle says he “ended up dropping [Calculus II] and then turned his Physics course to pass/fail. Kyle his plans in engineering were “just over from there.” Not only were the classes difficult, but Kyle also found that he did not enjoy their theoretical nature:

I decided that I didn’t really want to do that anymore because I don’t really like working in theory... I’m doing a page worth of work to see one equation work out and then I have to do it over and over again.

Kyle was also balancing this work with his involvement in a fraternity he had joined, which “took up all of [his] time” and began questioning his academic plan: “What am I doing right now? Why am I doing this to myself if I’m not enjoying it and not doing well?”

Technology Education: “All the Fun Stuff Without the Math”

During his sophomore year, Kyle took a 3D modeling class with a professor that was “really, really cool.” The professor had “a lot of the same interests that [Kyle] did” and Kyle began talking to the professor about the field: “I was talking to him and it sounded like it would be something I wanted to do.” The professor recommended that Kyle “look into the [teacher]

licensure program because [he'd] have more opportunities after [college] to get hired, either in the field or with teaching.” Kyle said he would “think about it” and he went to an open house for the program. Kyle says the students at the open house “sold him on it”: “[The students] were like, ‘Our college has a 100% hire rate, I’ve been getting job offers every other week.’” Kyle remembers thinking, “Alright, that seems pretty cool, and good job security is always a benefit. This doesn’t pay as much as engineering, but I can still do things with engineering companies.” Kyle also thought the work aligned well with his interests: “Basically, I get to do all the fun stuff without any of the math.” Kyle talked to others in his life about this decision, including his mom, a counselor, and an alumna from his fraternity who is a teacher at a local school and who has served as somewhat of a mentor: “He was like, ‘Yeah, I think that would fit your personality well, you can pretty much talk to anybody.’ So, I was like, ‘Alright, I’ll apply.’” Kyle then went ahead, declaring a major in technology education. Kyle says he had “never really considered [going into teaching] before this point” and still didn’t necessarily see himself becoming a teacher, even after making this decision. Instead, Kyle was more interested in drafting and 3D modeling, seeing teaching “more of like a fall back,” a secondary career option if a career in industry didn’t work out.

NCTFP: “I Thought It was Just a Scholarship”

Immediately after declaring a major in education, Kyle received an email about the NCTFP: “I got into [the education program] and as soon as I got that, I applied for the Teaching Fellows because I got an email about it.” Kyle recalls reading a little bit about the program at the time he first received this information:

When they sent the email there was a website that you could go to and it told you a little about it. It didn’t tell you the specific requirements, but it gave you a general overview of

what the Teaching Fellows is and what they do. I just looked at that and was like, “Okay, I’ll apply for it.”

He describes, “I think it was just... ‘Oh, they’re bringing back the Teaching Fellows to [institution], go fill it out if you want to try to become a part of it,’ or something like that, and it offers a scholarship or whatever.”

I applied, and I got into the semi round...I went in for the interview and was super nervous because they were asking some pretty hard questions that I’d never thought about like, “How would you correct a behavior in your classroom?” ... It was things that I’d never really thought about because I didn’t really think I was going to go into teaching.

Still, the interview went well and Kyle was invited to join the NCTFP. Kyle accepted the invitation, saying, “I got accepted and I didn’t really read it until a little bit after.” I asked Kyle what he meant by this: “The loan thing...when I applied for [the NCTFP] I thought it was just a scholarship, but it’s a forgivable loan.” Kyle had been attracted to the program due to the funding support, especially given his sensitivity to college costs even from the beginning of his decisions about college. Kyle had not realized that the NCTFP funding was offered as a loan, not as a scholarship, until he had already agreed to participate. Kyle continues, “I was like, ‘Alright that’s fine, I’ll go teach, I’m not opposed to it,’ because I feel like I’m pretty good at talking to most people without a problem...I’m like, ‘Well, alright. Okay, I guess.’” Kyle further describes, “I was just kind of going in blind. I knew I probably should have done more reading about it, but I didn’t.” “I’m a pretty flexible person, so I’m usually okay with doing most things. I didn’t know about it, but it doesn’t bother me at all that I have to do it.”

The program’s financial support was the primary reason why Kyle applied for the NCTFP:

It does offer money, and I wanted to limit the loans that I had to take out...not that I'll have a lot of debt after college, but still a decent amount. I wanted to try and cut that down as much as possible so that when I get out it's easier on me.

He adds, "I thought that it would offer me the opportunity to not have to pay back those loans...I mean, it will after college, but right now it's kind of still a loan."

In addition to the financial support, Kyle also thought the program would help him get a job if he did enter teaching: "I thought, 'Well, this is a nationally recognized program, it would definitely be pretty good on a resume if I do decide to go into teaching.'" Although Kyle was unfamiliar with the original NCTFP, he learned a little bit about it when reading about the NCTFP before he applied, thus learning about the original program's reputation. This was also appealing to Kyle as he thought about his future: "I wanted to make sure I have a pretty good resume because I know how important it is to have the experience and all that stuff when you're getting a real job."

Even though Kyle had chosen a major in education and applied for the NCTFP, it wasn't until Kyle understood the program's post-graduate service commitments that he began to see himself entering teaching:

It wasn't really until I got into the Teaching Fellows that I decided that I was going to do teaching. It's a forgivable loan, if you go teach, you get a certain amount forgiven. So, I decided that that's what I wanted to do for a little while, at least until I get it all forgiven.

I felt like I could possibly make a change in someone's life while I was there.

As a teacher, Kyle is especially motivated to serve as a positive role model for his students, especially due to the experiences he had with unsupportive teachers while he was growing up: "I just want to be more encouraging than my teachers were to me."

As he has gotten more involved in his education major and with the NCTFP, Kyle says the program “[has] been a really good experience so far.” Kyle has a work study job at a local middle school where he serves as a teacher’s assistant and tutor, an opportunity he was able to get through his connections with the NCTFP. Kyle has been able to incorporate his interests in 3D modeling into this position and designed a project where sixth grade students created a playground using the software. Since entering the NCTFP, Kyle has also observed a high school class and sees high school as a better fit for his interests, mostly because the kids are “more mature” and “better at communicating” than the middle school students he’s worked with. In addition to these experiences, Kyle has also “taken a few education classes” and now “feel[s] more confident going into [teaching].”

Future Plans: “It Would Just Depend on the Financials”

As a junior, Kyle will receive two years of funding through the NCTFP, which translates into two years of required teaching service at a low-performing school, or four years at a school not considered low-performing. Despite not initially understanding that the program’s financial benefits were forgivable loans instead of scholarships, Kyle says he now understands the program’s requirements “pretty well”: “I talked a little bit more with the advisor that covers all of the Teaching Fellow stuff and I did a little bit more reading about it.” Although Kyle had indicated that he is “very certain” he will complete all service requirements in the initial interest survey to participate in this study, Kyle expresses less certainty in our first interview, explaining that his decision will depend on his employment prospects in teaching and in another field of even greater personal interest, architecture:

It depends on what the job market is like at that point. Depending on the offers I get, I’ll probably go into teaching, but if there’s an offer for an architecture firm that’s pretty good then I might not be able to turn that down.

Kyle explains that receiving a high enough starting salary in architecture would offset the NCTFP funding converting to loans:

It would just depend on the financials right out because architecture is one of the things that I do really want to do and if I have the opportunity...say I'm earning \$70,000 as an architect, I would just be able to pay off the loans instead of having to go into teaching. Not necessarily that I wouldn't still go into teaching, I would definitely still explore the option, it's just like which would help me a little bit more?

At the moment, Kyle is looking for an internship related to architecture.

Low-Performing Schools: “The Shortest Option”

If Kyle does enter teaching, however, he plans to look for a job at a low-performing school to finish his teaching service more quickly:

I'll probably try and go to a low-performing school. Not that teaching for longer would be a terrible thing, but I do kind of want to just get in, see how I like it, and if I end up not liking it, I'll only have to do two years instead of four. So, just kind of seeing where that's at gives me the shortest option. If I end up not liking it, then I don't have to do it if I don't want to, because I already have the loans forgiven and stuff like that.

In addition to finishing his service more quickly, Kyle is “pretty sure” the first high school he went to was considered low-performing and he believes he would relate well to students in that environment because he grew up in challenging environments himself.

At the time of our first interview, Kyle had recently attended a presentation for another teacher support program offered through his institution that provides a stipend for graduates who teach in rural schools. Kyle saw potential in entering this program while teaching to meet NCTFP requirements: “[The stipend would be] on top of getting your loans forgiven from the Teaching Fellows and your teaching salary.” Although Kyle had mentioned that teacher salaries

are lower than those in architecture and in the other technical fields he was originally considering, he notes that the teacher support programs add up: “Because of the added benefit of having those loans forgiven, it would end up being my salary and then \$20,000 extra, basically.” However, by the time of our second interview, Kyle realized that he was ineligible for the program based on incorrect advice he’d received from an advisor about his course requirements and graduation timeline, leading him to miss the program’s application deadline. Kyle had since, however, learned about another loan forgiveness program through North Carolina, information that he’d heard while on a school visit with other education students and faculty members. By combining the NCTFP funding with other aid money, Kyle says the total financial support could be equivalent to what he could make in a higher paying field: “Almost like I’m working at an architecture firm or something for a little while.”

At this point, Kyle is leaning toward entering teaching because of the opportunity to forgive his loans through the NCTFP: “I’ll probably go into teaching for a few years. Make sure I get the loans forgiven because it does take a considerable chunk of my loans out.” However, even if he does enter teaching, Kyle doesn’t necessarily picture himself staying in the field: “My plan is kind of to get [the NCTFP service] over with and then potentially get my master’s in architecture.” Kyle has also considered the idea of going into another field and coming back to teaching to fulfill his requirements:

With the Teaching Fellow requirements, I do have 10 years to complete the years that I have to teach, so I could potentially do a few [years] at an engineering or architecture firm and then decide, “Oh, I’m just going to teach real quick and come back after that or something like that.” I do have a lot of flexibility, luckily, so it just kind of depends on which opportunities present themselves when.

Felicity

Early Interests: “I’ve Always Wanted to Be a Teacher”

Felicity created her timeline in advance of our meeting; she is currently student teaching and had time to do so while students were taking tests in her classes. Felicity’s timeline is exceptionally detailed, and we spend the entire first interview talking through each point. Felicity starts the first interview by sharing, “I’ve always wanted to be a teacher,” referencing the budding interest she developed as a preschooler playing teacher with her younger sister: “I would force my little sister and stuffed animals to read books and take tests.” Although the family lived in North Carolina, Felicity’s mother had been laid off from her work and decided to pursue a certificate program at a community college in South Carolina to expand her job opportunities. While working on her schooling, Felicity’s mother brought her to preschool out of state.

Felicity grew up enjoying school and did well academically. As a middle school student, she attended a low-performing school where students were given the opportunity to participate in a magnet program designed to “boost [school] test averages and their school report card.” As part of the program, Felicity read the book *October Sky* and took a school trip to the Kennedy Space Center in Florida. Throughout middle school, Felicity dreamed of becoming an astronaut, although her “dreams got a little crushed when they discontinued the traveling-to-the-moon astronaut missions.”

While in middle school, Felicity’s academic performance began to stand out, especially in math. Felicity remembers taking Algebra I and asking many questions about the applicability of the math to the real world, questions that Felicity’s teacher “misinterpreted” as a lack of understanding of the subject. To her teacher’s great surprise, Felicity earned a 95 on the end-of-course exam. Although Felicity wasn’t necessarily interested in math at the time, the research she was doing about a career at NASA helped her see the applicability of math, piquing her interest

in the subject: “I really wanted to do this summer program that NASA had, but my mom couldn’t afford to send me to it...It was a lot of math classes and physics classes. It got me really excited.”

Original NCTFP: “One of the Chances I Had to be Able to Afford College”

In middle school, Felicity remembers hearing about the original NCTFP through one of her teachers who was a former Fellow: “She loved it, and she always made sure to tell us how awesome she thought it was, and how beneficial she felt coming from the program.” Felicity’s class had been talking about college scholarships and loans when her teacher mentioned the NCTFP: “[The teacher] was like, ‘This forgivable loan... I get to do what I love, which is teach you guys, and not have to pay this money back. It’s a win-win.’” These comments stood out to Felicity based on her own interest in teaching and her concerns about affording college:

I’ve always been very conscious of my mom and my sister and I’s situation and knew that college might not be the easiest route for me to take as far as us being able to pay for it... When I heard [about the NCTFP], I was like, “This is awesome. If I want to teach, which was still something I thought might be possible, that would be really cool.” Then when I heard that it was discontinued, I was like, “Well there went one of the chances I had to maybe possibly be able to afford to go to college.”

Math Education: “Combine Two Things I Really Like”

Felicity continued to excel in math and as a high school junior, she took Pre-Calculus with “The strictest teacher at [her] school, notorious for never giving anyone A’s.... she taught classes like college professors teach their entry-level math classes.” Felicity found the challenge motivating, thinking: “I’m going to show them. I’m going to still get this A that I really want.” Indeed, Felicity went on to earn an A: “Pre-Calculus was something that I picked up really fast... That went really well, [the teacher] was very surprised”:

When students continuously did really well on all of her assignments, she was able to pick up on, “Okay, this person has some sort of really good math brain” ... That helped a lot in assuring me that I did have some sort of, not just passion for math, but also a math ability. I can do the higher-level stuff that a lot of people can’t or find really difficult.

At the same time, Felicity was beginning to see her initial goal of becoming an astronaut as out of reach, “like something I would really enjoy doing but not something that would be attainable.” Felicity began to tutor students in math and began to think more seriously about teaching instead: “I really enjoyed [tutoring]. It was like, ‘Why not just combine these two things I really like, and become a math teacher?’ That’s what I did when I applied to [colleges].”

Full College Scholarship: “Made My Decision for Me”

Felicity applied to two in-state public institutions and one “very expensive” out-of-state private institution. Felicity was admitted to all three, receiving “the biggest academic scholarship [the private institution] had available,” although it would still only cover half of her tuition. The second institution was close to her home but was larger than she wanted. The third institution was smaller and several hours away but close to extended family in an area that she visited frequently: “If I just move from one set of family to another set of family, is that really moving away?” However, despite her familiarity with the area, visiting the college as a prospective student was “The first time [she] saw [institution] as a school rather than this place I had just been a bunch of times.” Felicity received a full scholarship to this institution, which she says, “kind of made my decision for me.” Felicity says, “My mom joked and said that if I received a full scholarship from one place, she was not going to pay for me to go somewhere else.”

Teaching: “You Could Do So Much More”

Because Felicity taken and performed well on the AP Calculus exam as a high school senior, she placed into Calculus II in her first semester in college. Felicity quickly discovered she

was the only first-year student in the class: “This guy...he was like, ‘No way. You're not a freshman...we're all juniors and seniors. What are you doing in this class?’” Felicity says, “It was a very intimidating first class. I was terrified.” Yet, again, Felicity did well and even began tutoring math for 10 hours a week, including for her peers in Calculus II: “They needed a tutor, and I was like, ‘Oh, well, I'm in college, I need some money, I'm poor.’ So, I was like, ‘Why not?’”

As she continued to perform well, Felicity's professors took notice of her ability:

My math professor who I had for Calculus II, I guess when realizing I was a freshman, I was getting A's on all of my tests, that my math ability was pretty up there. He was like, “Math education, yeah, you'd be a good teacher, but you'd also be really good just with math in general...your ability would be better suited in engineering or some sort of math field, rather than just teaching.”

At the same time that Felicity was receiving this advice from her professors, she was also hearing it from her family. Felicity says:

I was very confused because it wasn't just my professors. I love my family to death, but they were also like, “Well, teachers in North Carolina don't get paid very well. It's not a valued profession in North Carolina,” with all the things that were happening. They were like, “You could do so much more, and you could go to a field where they value your abilities more” ... Hearing that from people who I looked up to, and people who I respected, and people who knew me the best made me extremely confused.

Felicity's grandmother was particularly outspoken on the issue:

She's kind of mellowed out now, but she just thinks that I could do a whole lot more and go somewhere that would value me more. She sees the way that North Carolina has had

some bad decisions as far as teachers go. The fact that their pay is so low...my grandmother is like, "I just want what is best for you."

Although Felicity understood the reasoning behind this advice, she also found it confusing:

I was like, "Well, maybe I should think about other things, or do something else, or consider other options." Because, other than NASA, I only ever really considered wanting to be a teacher. I was like, "Well, maybe this is my time where I'm supposed to figure something out or test other waters or try to see what else is out there."

American Indian Studies and Math: "Just to Keep All My Options Open"

To fulfill general education requirements, Felicity began taking classes in American Indian studies (AIS) in her first year, a subject of interest based on her heritage. As much as she liked math, Felicity also found herself "really interested" in the AIS classes. By the end of her first year, Felicity felt torn between her multiple interests and the advice she was receiving:

At the end of my freshman year, I was like "I have no idea." I have all these professors telling me I shouldn't teach. And I was really interested in American Indian studies, which was a field that I had never learned anything about growing up other than when I would go to [family's town] and go to the pow wows or the museum.

Conflicted, Felicity decided not to study math education after all, especially since the requirements for math education would have prevented her from double majoring in AIS and graduating in four years: "I changed [my major], I decided to double major in mathematics and American Indian studies...just to keep all my options open." To make sure she could complete both degrees in four years, Felicity began taking online summer classes after her first year.

As Felicity pursued math and AIS, her advisors in both subjects encouraged her career exploration in each respective field. In math, the department chair had taken her on as his advisee, telling Felicity:

“You could do anything with your math degree. You can be an engineer, you can go into physics. You could get a graduate degree in anything” ... He was like, “It really does open a lot of doors and options for you.” He was really excited to look at some of those options. I think that got me a little excited to see what was out there.

Felicity also got the same encouragement from her AIS advisor:

She was doing the same thing but on the other end. She was talking about all of my options, because it’s a very odd degree. You don’t hear about it a lot, at least in this area. She was like, “I don’t want you to think that this is a wasted degree. There’s so much you can do. You could work in a museum.” That kind of piqued my interest, because I would still be teaching people or helping people to learn things. That’s still really cool.

Felicity found herself enjoying her AIS courses based on their connection to her own family’s history. As a sophomore, Felicity interned at an American Indian museum, frequently sharing what she was learning with her family:

One of the books we had to read was actually about my great-great-great-grandfather, which is really interesting in an academic setting, getting to read stories and myths and legends about your family. My mom and my grandmother ate all that stuff up. They were like, “This is so cool. You’re learning all these awesome things about not just who you are, but who we are as a family.”

Felicity saw AIS as a deeply personal subject that also aligned well with her interest in education. Felicity began looking into graduate programs in the field, soon realizing that the closest program was in Oklahoma: “Do I actually want to uproot my life in North Carolina where I’ve always lived to move all the way across the country?” After learning this, Felicity turned her interest back to math: “I was like, ‘Okay, let’s look at some of what math has to offer.’” At the same time, Felicity’s AIS advisor had taken a job at another institution although. Before leaving,

Felicity's AIS advisor helped her plan out the rest of her coursework and realize that, even with two majors, she would finish college one semester early.

Now focused on math, Felicity began to look into engineering graduate programs. However, she says, "I could never convince myself that engineering was something I was interested in." Felicity describes, "The idea of sitting at a desk or crunching out numbers all day just never appealed to me. I was very much a people/interaction kind of person." As a junior, Felicity took an internship with her Mathematical Physics professor, during which she interviewed STEM professors about their backgrounds. The experience allowed Felicity to reflect on her interests: "Listening to their stories... made me realize I enjoy the beauty of math. I never enjoyed applying the math to engineering, or applying it to physics... I just enjoyed doing the pure math." These conversations "Helped a lot in trying to decide where in the world I was going to try to go after that," which was "a big decision," especially in the context of the knowledge that a career in applied math would give her "a good paycheck" allowing her to "support her family," and that her "family would be proud" if she took that route. Felicity says, "To admit that wasn't what I wanted to do took a lot." Yet, Felicity says her family was "surprisingly okay" with her decision not to enter applied math and were "happy that she had considered it and "not counted [herself] out" when she told them about her choice.

Choosing Teaching: "I Want to Be a Math Teacher"

As she neared college graduation, Felicity found herself back where she had started: "I was like, 'Well, I graduate in six months. I still need to decide what I want to do.'" Felicity had a conversation with one of her professors, a math education professor, about this concern:

I was like, "I don't know what I want to do. I feel like at this point I should have had some sort of idea." She had been kind of keeping up with me, because the math department was very small. She knew I had done all these different internships. She was

like, “Well [Felicity], think about your three years at [institution]. What is the one thing that you've always done?” I had always tutored. I was like, “Well, yeah, I've always tutored, but that was easy. I helped students with their math. I got paid for it. It made me happy. I was really good at it. I enjoyed meeting all the students, the freshmen who came in terrified of taking college algebra, to the non-traditional students who were coming back in their 50's and 60's to finish their degrees who were totally inspiring. They were going to pass this math class if it was going to kill them, and I was going to help them.”

She was like, “You've changed your mind on the museum stuff. You've changed your mind on the applied math stuff. But being a tutor is something you've never considered stopping. When people ask you what you do...you're always in that computer lab helping people. You're always taking more hours. And students come back and tell us that you're doing such a great job. That you're helping them understand this stuff.” I was like, “Oh.” She was like, “So really, you've known. Inside, you've always known what you wanted to do, and this is it.” That's when I was like, “Okay, well, maybe this whole math teaching, maybe I wasn't crazy at the beginning.” It still took some time to convince my family that I was accepting a very large pay cut to go into teaching.

From that conversation, Felicity says she had decided on a career in math education: “I was like, ‘Alright, well, I want to be a math teacher.’”

New NCTFP: “Whoa, That's Me”

Having decided to become a teacher at the very end of her undergraduate career, Felicity started researching the ways to gain licensure outside of a bachelor's program. Felicity opted for a one-year “intensive” MAT program, which she preferred over two-year programs where she could teach full-time while completing her degree. Felicity identified three North Carolina institutions with this type of program and applied while in her final year of college.

While looking at graduate programs, Felicity heard that the NCTFP “might be coming back” from one of her professors. While visiting one prospective institution, Felicity learned that the NCTFP was officially back, and that the institution had just been selected as a partner campus. Felicity also learned that she would be eligible to apply to the NCTFP based on her plan to become a math teacher: “I was like ‘Whoa, that’s me.’” In March 2018, Felicity was accepted to the NCTFP partner institution that she had applied to and had also received a merit scholarship from the institution that would cover her tuition and fees. The next week, she learned she had also gotten into the NCTFP: “To get the Teaching Fellows thing, I had to go to [institution], which is where I had also gotten the other scholarship. It all worked out.”

Felicity accepted the invitations and is currently on schedule to complete her student teaching and graduate in May 2019. At this time, Felicity will be qualified to teach math in grades 6-12, but she is “leaning more towards the high school end of things.” Felicity is “very certain” she will complete her NCTFP teaching service requirements, as she had already planned to stay in North Carolina and is only receiving one year of funding, translating into a maximum of two years of required teaching service if she enters a school not considered low-performing. Felicity has already signed a job contract with the same school system that she attended, a commitment that she made as a result of attending a teaching job fair in December 2018. Because the school system she will teach at “doesn’t have any deemed low-performing high schools,” Felicity expects to teach at a school not considered low performing.

CHAPTER 5

CATEGORY-CENTERED FINDINGS

This narrative case study explores the career-related development and decisions of 10 participants in the North Carolina Teaching Fellows Program (NCTFP). The purpose of this study is to understand the experiences that influenced students' interest in teaching, in teaching secondary STEM subjects, and the role of the NCTFP in students' career decision making and future plans. While Chapter 4 addresses RQ1 related to NCTFP participants' storied experiences using narrative thematic analysis, Chapter 5 presents findings from category-centered analysis based on this study's theoretical frameworks to address RQ2 and RQ3 (Riessman, 2008).

RQ2: What are the key experiences that shaped the development of participants' interests in careers in secondary STEM education?

RQ3: What are the perceived benefits and costs of NCTFP participation and how does the program shape participants' college and career plans?

- a. How do the benefits of the NCTFP shape participants' decisions to attend a partner institution?
- b. How do the benefits of the NCTFP shape participants' decisions to pursue academic programs in secondary STEM education?
- c. How do the benefits of the NCTFP shape participants' career goals related to teaching in North Carolina, teaching at low-performing schools, and plans to stay in teaching long-term?

First, I present findings related to RQ2 using social cognitive career theory (SCCT). These findings center self-efficacy as the primary theoretical component contributing to career interests. Second, I present findings related to RQ3 using principles of behavioral economics, namely the consideration of costs and benefits in decision making under a bounded rationality.

Development of Interest in Teaching STEM Education

To address RQ2 regarding the key experiences that contributed to participants' interests in teaching careers, and in teaching secondary STEM subjects more specifically, I use the SCCT framework (Lent et al., 2002). According to SCCT, self-efficacy leads to positive outcome expectations, with both constructs then working together to foster career interests. In the SCCT model, interests are formed when people view themselves as competent in a particular task or domain, building positive expectations about their future performance in similar tasks, and continued pursuit of these areas. Based on the key role of self-efficacy in the development of career interests, I focus analysis related to this research question on the four sources of self-efficacy: personal performance and accomplishments, vicarious learning, social persuasion, and physiological and affective states (Bandura, 1997; Lent et al., 2002). Findings are organized by these four sources, summarized in Table 5.1, and detailed at length in the text below.

Table 5.1

Themes for Participants' Development of Self-Efficacy in Teaching

Self-Efficacy Source	Theme
Personal performance and accomplishments	Teaching-related experience: "It was fun pretending to be a teacher"
	Academic performance: "One of those kids that did well in school"
	Poor performance in other areas: "That's not good"
Vicarious learning	Family in education: "My mom's doing it, so I want to do it too"
	Positive teacher role models: "I want to be a teacher just like him"
	Negative teacher role models: "I had a lot of really bad teachers"
Social persuasion	A turning point: "That's the perfect thing for you"
	Ability: "You could do so much more"
	Teacher pay: "You're not going to make enough money"
	Job constraints: "Worried about administration"
Physiological and affective states	Positive affect: "That is what I want to feel for the rest of my life"

Personal performance and accomplishments. The strongest source of self-efficacy is successful performance and accomplishments in a particular domain (Lent et al., 2002). While strong performance raises self-efficacy for related tasks, failure lowers self-efficacy, with respective results strengthened if good or bad performance is repeated. Although natural aptitude can build self-efficacy through consistently strong performance, however, easily-obtained success through natural skill alone can create an expectation of quick results. In such cases, obstacles and challenges can deter continued pursuit and interest in a certain domain (Bandura, 1994). With the same logic, difficult tasks and subsequent perseverance and resiliency can be especially powerful in the development of self-efficacy over time.

The relationship between performance and self-efficacy was bidirectional in the present study: participants sought school and teaching-related experiences based on budding interests, and success in these roles led to growing self-efficacy towards teaching and continued experiences in these domains. The themes related to personal performance and accomplishments include: Teaching-related experience: “It was fun pretending to be a teacher,” Academic performance: “One of those kids that did well in school,” and Poor performance in other areas: “That's not good.”

Teaching-related experience: “It was fun pretending to be a teacher.” For many participants, an interest in school, and in teaching, began very early in life. Four participants described “playing school” or “playing teacher” as among their earliest memories related to their interest in teaching. Overall, eight of 10 participants developed interests in teaching long before the introduction of the NCTFP (Kyle and Christy as the exceptions). Furthermore, nine of 10 participants (Kyle as the exception) described having teaching-related experiences throughout their life course in both formal and informal roles, experiences that allowed participants to explore their skill sets in roles resembling teaching. More formal teaching-related experiences

described included tutoring, babysitting, leading a youth group, serving as a peer mentor, refereeing children's sports, interning in a classroom, and working as a camp counselor.

Tutoring in particular was an especially common experience among participants during both high school and college and was also especially impactful for participants in gaining related experience and building confidence in their teaching skills. Zoe describes:

The summer after my sophomore year I tutored a family friend. He had a C, he wanted an A, I went and helped, tutored him for free...I still pretty much tutor people for free...I went and helped him, and he said that he was getting it. I was like "Oh, so, maybe I can explain things."

Christy shared a similar story where she noticed her ability to explain math concepts when working with younger students:

I joined student council... you could either choose peer tutoring or you could work alongside teachers. I sort of did both, but I focused more on peer tutoring...I helped ninth grade students if they had problems with any of the topics that they were learning. I would help them look at the problems in a different way so that they could understand.

Felicity also tutored students while she was in high school, an experience that helped her see a way to apply her interests in helping, and in math, to a viable career option:

In high school, I tutored a little bit. Realized maybe NASA wasn't my dream goal anymore, per se. That was more like a very far off reach, like something I would really enjoy doing but not something that would be attainable, almost. I was tutoring at the same time, and I really enjoyed that. It was like, "Why not just combine these two things I really like and become a math teacher?"

Based on her experiences tutoring in high school, Felicity went on to tutor throughout her undergraduate education, a common decision for participants in the present study.

Several participants also described experiences helping out in actual classrooms. For Victoria, holding several internships in elementary schools helped her to gain experience working with students while also learning more about teaching careers:

One of the teachers [I interned with] was actually one of my third-grade teachers. I was able to go in her classroom and she'd have me work one-on-one with the students. Be like, "So-and-so is not understanding this topic as well, can you sit down with them and help them work through their math homework?" "Sure, no problem." I'd do that kind of stuff often. Occasionally she'd be like, "Hey, read this book out loud to the class" ...Just little things like that, but I was really working hands-on with these kids and not just observing in the back of the classroom, but really getting to get in there and actually do teaching things.

Other students described similar direct experiences with teaching, although in less formal roles. Taylor's chorus teacher, for example, had asked her to help lead the class, which led to the teacher encouraging Taylor's interest in a career in music education. Taylor says, "Senior year I was the person she would let lead the class when she wasn't there. She had watched me do that for three years and she was like, 'You're good at it, you could [become a music teacher] if you wanted to.'"

Other teaching-related roles included helping teachers prepare for class, working with people with disabilities, helping peers or younger students with school work, and more. These opportunities were especially common for participants with family connections to the teaching profession. Taylor, whose mom is a teacher, shared:

In second grade, my mom and I were at the same school for the first time so I would stay after school every day with her and help her in the classroom. I would go around and help

all the other teachers on her team. It was fun pretending to be a teacher in second grade and doing all those things.”

Zoe also had exposure to teacher-related work through helping her grandfather:

I used to go to middle schools a lot when I was growing up. I would sit in my grandpa's classroom because he did middle school science. I would be in his classroom grading his papers or working with his Science Olympiad team that he had when he was teaching. I would help them get their stuff together.

Exposure through family also influenced Monica’s interest in the profession, especially in working with her brother, who has autism, and an uncle who has cerebral palsy, experiences that prompted her initial interest in special education. Monica further developed an interest in teaching after she worked with her brother to publish a children’s book about a child with special needs, then visiting classrooms to read the book to students:

That was a huge turning point for me, because I read it to so many classes at my school. I was like, “This is so fun. I love this.” I was always very passionate about helping students and special needs, but that whole process... That was really what like made me decide... transferring from like, “Oh, I want to do something like being an author or go into English, to, “Okay, cool. I wrote something, but like I like sharing it with all these people more than I actually did like putting it together and writing it.”

These varied experiences, occurring as early as preschool (as in the examples of participants playing teacher as children), or as late as through the end of a bachelor’s program (e.g., Felicity tutoring adult students), not only allowed participants to test their skills in helping, mentoring, and teaching new concepts, but also helped informed participants’ decision-making about the grade levels and subjects that they may want to teach. Through her internships, Victoria was able to confirm an interest in teaching and her original interest in teaching

elementary school students. Zoe also confirmed her interest in working with middle school students based on her experience in her grandfather's classroom. Kristen worked with middle school students through refereeing soccer, which helped her to develop an interest in working with that age group:

I refereed soccer throughout high school, and mainly did 11- and 12-year-old girls, which is sixth-ish [grade]. I really like that age... I didn't even necessarily work with them because I was their ref, but I just enjoyed spending time with them more.

Even Kyle, who has recently begun to gain teaching-related experience as part of the NCTFP has been able to use experiences with both middle school and high school students to confirm his interest in teaching high school:

High school has been a lot more my speed because a lot of times the kids will know what they're doing and you don't really have to explain too too much, and they're easier, they're better at communicating, basically. They're slightly more mature than they would be in middle school.

Academic performance: "One of those kids that did well in school." A second source of performance-based self-efficacy was participants' performance in school, particularly in the subjects they are preparing to teach. Receiving good grades was one of the primary reasons why participants enjoyed school and how they chose specific subjects to teach, with grades serving as tangible and somewhat objective evidence of their skills in these environments. Good grades were memorable; several participants recalled the specific grades they received on standardized tests and in their courses through their elementary and secondary grades: "In fifth grade, I got a 100 on my reading [end-of-grade exam]. It's probably something very rare to remember, but it stuck with me" (Zoe). Taylor also remembered her sixth grade math grade: "I spent most of the year with a 98 average in that class," and Felicity, too, remembered her performance in eighth

grade on the end-of-course (EOC) test, especially because her teacher was surprised at her success: “[The teacher] was just as surprised as I was that I scored a 95 on the EOC.” Successful academic performance was one of the most common sources of performance-related self-efficacy for students; not only did participants see that they could succeed in school environments, but also within certain subject areas.

For some participants, receiving good grades came naturally, sometimes even in spite of a lack of interest in certain subjects. Zoe had a natural talent for science and math but a relative disinterest in the subjects: “I don’t like science, I don’t like math, but I’m really good at them. I don’t know how that happened, probably genetics.” Zoe is currently preparing for a career in science education because of the NCTFP subject constraints and because of her demonstrated academic success in these subjects, explaining that this plan may be “for the better because [she] is so good at science, maybe that’s what [she] was supposed to do in the first place. For participants who planned to study STEM subjects prior to applying for the NCTFP, interest and performance aligned; participants enjoyed the subjects that they were performing well in.

Participants not only developed an interest in the subjects they consistently and naturally performed well in throughout their education, but also subjects that they had to work at. Monica had a natural talent in English and originally considered various careers in the subject, including becoming an English teacher. However, Monica realized that she also “loved” science, she just had to work harder in the subject to obtain the same success:

I love science, but science was something that didn’t always come naturally to me. If I did well in it, it was because I was putting in hours and hours and hours of work.

Whereas with writing, I was always a pretty naturally strong writer... I was like, “Oh, I need to do this because I’m better at it than this,” but the fact was I was just as interested in science. I just needed to apply myself more than I did with English.

Taylor and Kristen, both preparing to become middle school math teachers, each described the experience of struggling in math courses. Both students had performed well enough in their middle school math classes to receive teacher recommendations to move to an advanced level the following year. However, both struggled in the next level of math classes, finding that they'd missed some material by moving up. Taylor failed a test at the beginning of her new class and decided to return to grade-level math. Kristen struggled as well, cycling throughout different levels of math throughout the rest of her education. While both women decided to become math teachers, both chose middle school grade levels, which was when both had first received feedback that they were excelling in the subject.

In another example, Matilda chose a career in chemistry education because of her success in high school chemistry. While Matilda performed well in school across subjects, an interest in chemistry stuck, largely because of the work she put in to earn success in this particular subject. Because Matilda had learned the chemistry material without any help from her parents, she felt a great pride in her success and saw that teaching the subject would fit her skills and her experience well: "I was like, 'I could teach chemistry, because I had to teach myself it, so I actually understand it, more than the other subjects.'"

Poor performance in other areas: "That's not good." For some participants, an interest in teaching was supported not only by a developing interest in education and in specific subject areas to teach, but also by suboptimal performance in other subjects that led to discounting certain career options. For Kyle, difficulty in pre-requisite courses for engineering, his original career interest, led to his reconsideration of career plans. Kyle had not been admitted to the engineering college at the institution he selected and instead planned to take pre-requisite engineering courses and transfer in as a more advanced student. By his sophomore year, however, Kyle was not doing well in these courses:

I think I got an A in Calc I. Then, I got to Calc II and it wasn't the same, it was pretty hard.... I dropped it like two or three weeks in because we had taken a test and I got a 45. Actually, it might have been closer to around the drop date because I think I had taken two tests and I got a 45 on the first one and like a 50 on the second one. I was like, there's absolutely no way I'm saving my grade so I'm just going to call it quits... That was around the time that I was sitting there and thinking, "What am I doing right now? Why am I doing this to myself if I'm not enjoying it and not doing well?"

Kyle says his plans in engineering were "over from there." Kyle's interest in engineering diminished over time, especially as a result of difficult classes, leading to exploration and pursuit of a major in technology education.

To a lesser extent, Kristen also described struggling academically, although in a geometry honors class she was newly placed into. Throughout her life, Kristen was interested in math and did not perform as well in other subjects: "I wasn't really great at proofs, because proofs involved English. My specialty is not English, it's math." As a result, Kristen's career interests have "always been math." For Kristen, then, it was more of a matter of narrowing down which type of math-related career she would pursue. While Kristen was especially interested in architecture, struggling in a geometry class deterred her from pursuing this career path:

I wasn't in honors the year before, so I missed out on a chapter, and that chapter was radicals. So, I'd never seen the square root sign and my teacher...she asked the class if anyone had never seen a radical before and, when I raised my hand, she told me to stay afterwards, and then in that conversation she told me that I should think about dropping honors. I essentially said "No." I didn't, and I didn't do too well. I definitely struggled.

Kristen's performance in geometry led her to reconsider her interest in architecture, especially because her performance was compounded by negative feedback that she did not have the appropriate skills to pursue her career of interest.

While these are the two primary examples of poor performance in other areas that led to a declining interest in some career ideas while piquing an interest in another, other participants may not have discussed similar situations because other areas where they were unsuccessful may have been discounted early. Given the high importance of performance on self-efficacy and interest development, it's likely that participants pursued the subjects and tasks that they were most skilled in, while tending not to focus on the areas where they were less skilled. For example, Monica discusses that she was skilled in English but enjoyed science too, even though the subject did not come as naturally. Monica only really considered science education as a career option as a result of having a good teacher in the subject. Just as success can build self-efficacy in one area, difficulty and poor performance can undermine self-efficacy in another.

Vicarious learning. A second source of self-efficacy is vicarious learning. Seeing others succeed can raise a person's expectations for their own potential for success, especially when an individual perceives that they are similar to a successful social model. Participants tended to describe two categories of social models related to vicarious learning in education: family members in education and teachers in their lives. While family members in teaching were typically positive role models for participants, even if the family member wasn't actively encouraging education careers, teacher social models were more complex. Themes related to vicarious learning include: Family in education: "My mom's doing it, so I want to do it too," Positive teacher role models: "I want to be a teacher just like him," and Negative teacher role models: "I had a lot of really bad teachers."

Family in education: “My mom’s doing it, so I want to do it too.” Four participants (Christy, Kristen, Victoria, Taylor), had mothers who are in, or who had been in, teaching careers. None of the participants had fathers in education. Although none of these four women described their mothers (or any parental figure) as actively persuading them to enter teaching, the presence of a parent of the same gender in a teaching career is a closely connected social model that holds a high degree of similarity to the participants. The mothers of both Victoria and Kristen had been interested in pursuing teaching careers while both participants grew up, and Victoria and Kristen were both proud to see their mothers achieve these goals. Kristen enjoyed watching her mother “going into teaching and absolutely loving it,” eventually becoming a guidance counselor in schools, which she also “loves absolutely the same, if not more” than teaching. Victoria describes:

[When I was in] seventh grade, my mom became a preschool teacher, which doesn’t sound too significant, but my mom has always wanted to teach elementary education. She finally was able to become a preschool teacher and then I was like “Oh, well, my mom’s doing it, so I want to do it too.”

Similarly, Christy had seen her mom advance through education roles, starting out as a teacher, becoming a principal, and later getting involved in teacher advocacy and politics:

My mother, I know she stopped teaching, but she ran for office. [Teacher pay] was one of her main platforms, she went on to the Raleigh march that they had for teachers where they wear red... That’s one of the main reasons that she wanted to be a principal was because of what she was experiencing as a teacher. She just wanted to make a positive change in that area.

Christy’s knowledge of teaching comes from exposure to the career through her mother:

I've known so much about teaching because of my mom and her coming home and grading papers and talking about different things that she goes through in the schools. I was able to get a background on why teachers are the way that they are, and how they learn, and different things like that, so that was really great for me.

Christy's mom had been a Teaching Fellow herself and has shared insight with Christy "about her learning experience and how she got to come visit other schools and see how they taught."

While having a same-gendered parent in a teaching role is a close social model for vicarious learning, several participants also had extended family members in teaching. For Zoe and Monica, grandfathers played an important role in their interests in teaching. Although Monica's grandfather, a former college professor in English and philosophy, had passed away when she was young, Monica was often told that she and her grandfather were "extremely similar" and she attributes part of her interest in teaching to his career. By contrast, Zoe says she did not have a similar personality to her grandfather, a middle school science teacher, but she has spent significant time with him throughout her life: "I'm used to my grandfather coming home and helping [him] grade papers. I thought it was fun at the time and then I realized it is actually his job, this is a mandatory part of what he is doing." Zoe also recalls helping him to study for his National Board Certification, a process that she says "made [her] realize you can move up within teaching, which is something that a lot of people don't really realize...you can certify yourself, recertify yourself, move up." When Zoe became interested in the NCTFP, she also chose to prepare for a career in middle school science education, even setting a goal of establishing a Science Olympiad program once she becomes a teacher, a program her grandfather started and led at the school where he worked.

Despite family connections to teaching, no participants had family members actively persuading them to enter the career, with the possible exception of Christy. Christy's mother

promoted her entry into studying education by sending her information about the NCTFP and recommending that Christy consider the program. Christy clarifies that her mom only shared this information to “give another option,” and that her mother was supportive of Christy’s other career interests as well. Kristen and Victoria also described their moms as taking neutral stances on their interest in teaching but being generally supportive of all of their career interests. Kristen described her mom as an informal “guidance counselor,” only talking about her own career in education when Kristen asked her about the profession. By contrast, Taylor was the only participant with a parent in teaching who recommended that she not enter teaching. Despite this advice, though, Taylor saw her mom enjoying the career herself: “She’d try and talk me out of it and be like, ‘But I love what I do’...she’d contradict herself five seconds later.”

Positive teacher role models: “I want to be a teacher just like him.” In addition to learning about teaching through parents and extended family in the profession, participants also looked to their own teachers as social models for the profession. While all participants with family social models in teaching seemed to view these social models positively, perceptions of teacher social models were more complex. Participants often shared examples of teachers who were good role models who they wanted to emulate, with several participants also describing “bad” teachers who seemed to serve as a motivation for students to “do better” (Matilda).

All participants had good teachers in the exact subject and level that they each plan to teach. Monica especially liked her environmental science teacher and attributes her interest in teaching high school earth science to her positive experience in this class: “I had a really good science teacher and I was like, ‘Oh my gosh, I’ll teach science.’” While Monica says she had always been “really interested in science,” “clicking” with this teacher helped her to see this interest more clearly and look past the fact that the subject didn’t always come as naturally to her as other subjects did. Taylor, who plans to teach middle school math, points to her sixth-grade

math teacher as a critical role model in her development, a teacher who was “super empowering” and encouraged her to continue to pursue the subject. Kristen’s seventh grade year was a turning point in her education as well, as she performed well and “really liked” her seventh grade math teacher. Zoe, preparing for a career as a middle school science teacher, shared that one of her favorite teachers was in middle school science, a teacher that was “bubbly” and “engaging.”

Christy, currently in technology education, especially liked her high school technology teacher, whose role as a coach on the cheerleading team also inspired Christy to join the sport:

My cheer coach... she was my technology teacher...I would have her in her class and then afterwards school would end, and the conversation would switch from coding to, “Okay, what cheer uniforms are we going to wear?” ...That was a big influence about why I decided to join cheer because I loved her so much. I was like, “She’s an awesome teacher. She’s probably going to be really fun as a cheer coach as well.”

Kyle also really liked the teacher he had in an introductory engineering course in high school, a teacher who he felt he shared personality traits with, and that therefore helped him to see himself as a teacher, even if he didn’t start considering a teaching career until college:

I have a very mixed and open personality, I normally don’t have a problem with anybody. [My engineering teacher] had a similar “I don’t really care what you think of me, I’m going to do what I am going to do”-type of attitude that I have and that was really cool to see it being put into motion...that probably was the first kind of teacher I thought of when people were telling me, “I think you’d be an awesome teacher, I think you could do this pretty well.” Having seen that and having that personality match my personality was kind of like, “Okay, maybe I can actually see myself doing this.” But I didn’t start thinking about that until I got into the education program.

Kyle also later connected with a college professor from his SolidWorks 3D modeling class who was “really, really cool” and who Kyle also shared interests with. It was this professor who suggested that Kyle look into technology education, a conversation that Kyle says, “pushed everything into motion.” If Kyle enters teaching, he anticipates teaching technology education and/or 3D modeling.

Jenna, in middle school math education, says that her favorite class throughout school was a middle school math class where her teacher frequently led hands-on activities:

In my seventh-grade math class, my teacher, she would do a lot of hands-on stuff... We made these, it's like a decahedron thing. You cut out all these shapes, and you tape them all together, and it makes this huge 3D... papier-mâché thing... I think people find math boring, because when they think of it, they hear, “Oh, you just answer questions out of a textbook” ...But it's teachers like that that do the hands-on stuff that makes it interesting.

I want to bring that to my classroom, wherever I am.

While Felicity describes several teachers throughout her life, her pre-calculus teacher stood out based on her notoriously difficult reputation, and for Felicity's success in the class:

Our Pre-calc[ulus] teacher... was also the strictest teacher at our school, and she was notorious for never giving anyone A's. She was very hard, and people would come back and say that she taught...like college professors teach their entry level math classes. ...I actually ended up making an A in that class, which I think surprised her and surprised me. ...When students continuously did really well on all of her assignments, she was able to pick up on, “Okay, this person has some sort of really good math brain to be able to get through this stuff.” That helped a lot in assuring me that I did have some sort of not just passion for math, but also a math ability. Like, I can do the higher-level stuff that a lot of people can't or find really difficult.

This is also when Felicity learned what would become her favorite math topic, trigonometry. Felicity also had positive math professor role models through college.

While two participants did not bring up the teachers they had in their chosen subject areas during initial interviews, conversations in second interviews revealed positive experiences with the teachers in their same subject areas and levels as well. Victoria would have preferred to enter a position in elementary education (notably, Victoria's elementary teachers were positive role models in her own education journey), but she is currently choosing between teaching middle school science or math based on the NCTFP requirements. Although this was not her first choice, Victoria enjoyed math and science classes throughout her K-12 education and performed well in both subjects. Matilda also describes great success in her own high school chemistry class—the subject she plans to teach—due to her personal work put into the subject and her pride for doing so, but also because she had a good teacher in the subject.

Several participants have retained relationships with teachers past their high school graduation, including those teachers in their given subject areas (as is the case for Zoe, Monica, and Victoria), and other teachers as well. Zoe's science teacher helped Zoe and her roommate (a K-12 classmate) move into college, the same college the teacher had attended herself, offering to serve as a resource as Zoe starts her career: “[She and her family] came and helped us move in. She was like, ‘If you ever need any class stuff for your classroom, I got a whole bunch of stuff.’” Matilda is connected to one of her teachers on social media; Matilda says she “friended her on Facebook,” which has allowed the two to stay in touch and for Matilda to see the teacher's posts about teacher labor organization across the state. Matilda says:

I had a lot of teachers that I really loved, and they really helped me out. They definitely shaped me today and I just really want to be that for somebody. I want to be that teacher that you friend on Facebook after you graduate and you text them when you get into grad

school or a program and you're like, "Hey, I got in this. I thought you'd want to know."

So that's what I want to do, just because I had teachers that were like that for me.

Negative teacher role models: *"I had a lot of really bad teachers."* Although positive teacher role models played important roles in participants' interest in teaching and identification of subject areas and education levels of interest, "bad teachers" also provided an opportunity for vicarious learning. Both Matilda and Taylor described having "a lot of really good teachers and a lot of really bad teachers" throughout their K-12 educations. Taylor gave an example:

Sophomore year, I had this one math teacher that gave me a 100 on a test I never took.

He was terrible... I had him, I had a few other bad teachers, and I was like, "Wow, most of the teachers at this school are really bad," which was funny because I went to one of the best rated high schools in the state... I started saying, "Yeah we test well, but at what cost? Look at the kids, look at the education we're getting." I started thinking about that.

Taylor often talked about these experiences with her mother, who was also in education:

I'd come back home and be like, "Mom, guess what this teacher did today?" And we'd sit there and talk about it. I would be like, "Wow, this is how you don't teach. It's just going through four years of that was just like, "Wow." I was like, "I have potential to be doing so much better than that."

Matilda also described "bad teachers" as a source of motivation for her own teaching: "The really bad teachers, I was like, 'They are bad. I could do better than that.' They were making me sad...I knew that if I were in their place, I would want to help my students more." For participants, experiences with bad teachers drew attention to the great need for positive, supportive, and caring teachers who put effort into their teaching and treated their students well.

Social persuasion. A third source of self-efficacy according to SCCT is social persuasion, or verbal persuasion or feedback that someone has the capability to perform certain

tasks. Just as encouragement about one's capabilities builds self-esteem, feedback that one does not have the skills necessary for a task can undermine self-efficacy as well. In general, social persuasion is a weaker source of self-efficacy than others: "It is more difficult to instill high beliefs of personal efficacy by social persuasion alone than to undermine it" (Bandura, 1994, p. 73), since a person will place greater weight on personal judgments and tangible evidence of their own performance rather than encouragement alone. Thus, participants who described positive social reinforcement regarding their ability to teach often saw this feedback as confirmatory regarding their interests and beliefs about their capacity to teach. Feedback was also weighed alongside participants' own evidence that they were skilled in the areas they were considering. Social persuasion was sometimes described as a "turning point," (Monica) where comments from authority figures were especially impactful in confirming career interests and plans.

No participant reported receiving negative social feedback about their *ability* to teach, although two participants had received negative commentary about their abilities to work in other professions (Kyle and Kristen, as described above). Overall, participants were far more likely to encounter negative social persuasion about entering the teaching profession based on extrinsic factors such as teacher pay, with negative social feedback about participants' abilities actually more likely to focus on the idea that participants were *too capable* to teach. Themes related to social persuasion include: A turning point: "That's the perfect thing for you," Ability: "You could do so much more," Teacher pay: "You're not going to make enough money," and Job constraints: "Worried about administration."

A turning point: "That's the perfect thing for you." Several participants received feedback from others that they had the skills to teach, and/or to teach a specific subject, which helped to reinforce or even redirect their interests to the career, with this type of feedback

seemingly serving as a critical turning point in their decision-making process. For Jenna, a notable moment came as part of an academic competition in high school while she was presenting her team's work to a panel of judges. The judges commented on Jenna's presentation skills, saying: "You really captivated us in your speech. Have you ever thought of being a teacher?" This moment served as a confirmation for Jenna's interests in a teaching career; Jenna says, "After that, I was like, 'I know this is what I want to do.'"

While Jenna's example highlights social persuasion from a voice of authority that did not know Jenna well, other students received confirmatory comments and feedback from mentors who were more directly involved in their lives. Although Christy did not plan to become a teacher until she was accepted to the NCTFP, looking over her life course she recognizes several experiences of receiving positive feedback from serving in helping roles. In middle school, Christy was chosen to serve as a peer mentor, her "first experience with tutoring and helping other students." Christy recalls one of her teachers commenting on her performance, recommending for Christy to consider teaching or other helping careers: "One of my teachers said, 'Hey maybe you should consider becoming a teacher or thinking about helping other students.'" While Christy's experience with technology, the subject she plans to teach, is more prominent throughout her narrative than teaching-related experiences, this is the earliest moment that Christy recalls that reveals the possibility of pursuing a teaching career.

For Monica, social support came from her grandparents, her "toughest critics." Monica was "taken aback" when her grandmother was "so happy" to learn that she was considering a teaching career. This conversation was important to Monica's trajectory towards teaching: "That was a big turning point for me. All of my grandparents were like, 'I think that's the perfect thing for you.'" I was like, "What? Okay, then I have to do it now."

For both Felicity and Kyle, this confirmatory advice came from well-respected mentors who were in education careers themselves. Felicity's decision to become a teacher also stemmed out of a career-related conversation after she had decided not to pursue engineering or another applied math field, despite consistent persuasion from family members and professors to do so. In a conversation with a math education professor about Felicity's uncertain post-graduate plans, Felicity's professor pointed out that she had tutored math throughout her undergraduate education and had done well in the role: "Students come back and tell us that you're doing such a great job, that you're helping them understand." This insight, given by a respected faculty member, provided reassurance towards Felicity's earlier interests in the career: "That's when I was like, 'Okay, well, maybe this whole math teaching, maybe I wasn't crazy at the beginning,'" confirming her commitment to math education. For Kyle, similar reassurance came from an alumnus of his fraternity who teaches at a local school, a connection he sees as both a mentor and friend. While considering a major in technology education, Kyle sought advice from a number of mentors including his mom, a counselor, and this friend, deciding to apply as a result of the encouragement he received, especially from his friend: "He was like, 'Yeah, I think that would fit your personality well' ... So, I was like, 'Alright, I'll apply.'"

For Jenna, Monica, Felicity, and Kyle, social persuasion regarding their abilities to teach served as turning points in their interest in commitments to academic majors and careers in teaching. While other participants also received positive feedback about their teaching and helping skills, these experiences were described in less detail and referenced a general trend of support for participants' teaching-related skills over time.

Ability: "*You could do so much more.*" Participants in this study universally described receiving positive feedback about their ability to teach. In fact, several participants actually experienced others telling them that they were *too capable* to teach and, as a result, that a job in

teaching would be an insufficient challenge or fit for their intelligence and skill. For Taylor and Zoe, this advice came from the family teacher role models they looked up to, a mother and grandfather, respectively. Taylor says of her mom, “She wanted me to go into engineering...She was like, “You can go into anything math-related. I think you should stick with math, I think that’s a good option for you, but you can also do more than just education.” Similarly, Zoe’s grandfather, a science teacher, encouraged her to become a doctor. Zoe says her grandfather “had such big goals for [her]...He was like, ‘you can do so much more than what I do.’” Zoe says, “I was like, ‘I don’t think I want to.’”

Zoe faced similar advice when she asked two teachers for letters of recommendation for the teacher support programs she was applying to. Both teachers told her that she could “do so much more,” while expressing their own regret of not pursuing other careers. Like Zoe, Felicity also received similar feedback both from family members and from educators in her life:

My math professor who I had for Calculus II...He was like, “Math education, you’d be a good teacher, but you’d also be really good just with math in general.” Almost like, “Your ability would be better suited in engineering or some sort of math field, rather than just teaching” ...I [had] all these professors telling me I shouldn't teach...I was very confused, because it wasn’t just my professors. I love my family to death, but they were also like... “You could do so much more, and you could go to a field where they value your abilities more.” I guess hearing that from people who I looked up to, and people who I respected, and people who knew me the best, made me extremely confused.

Although Felicity originally entered college planning to become a math teacher, she was persuaded to pursue other options, ultimately choosing a major in math instead of in math education.

Matilda discusses a similar experience as Felicity, encountering social persuasion not to enter teaching due to her academic success. For Matilda, this feedback was sometimes expressed by others to her mother, a pediatrician, instead of to Matilda herself. Matilda discussed the disconcerted feeling associated with pursuing a career that isn't as respected as the careers of her parents: doctor and lawyer, and of her sister, who plans to become a nurse. Matilda describes the lack of respect that teachers receive as problematic and hypocritical, especially as people expect their children to receive a good education but do not encourage talented students to enter teaching. Like Felicity, Matilda received pushback about her interest in teaching from her grandmother who wanted her to enter a "challenging" career, implying that Matilda was "too smart" to teach. Instead, Matilda's grandmother encouraged her to become a brain surgeon or lawyer. Matilda's grandmother eventually supported her decision to become a chemistry teacher, which she considered a "better" option than Matilda's original interest in arts education.

Teacher pay: "You're not going to make enough money." Although social persuasion as it relates to self-efficacy is based on feedback on one's abilities, social persuasion related to extrinsic factors played a critical role in participants' consideration of teaching careers. SCCT situates contextual influences (job availability, pay, etc.) as proximal to the development of career interests, goals, actions, and attainments and, in the present study, social persuasion against teaching often accentuated these factors, especially teacher pay. Comments dissuading participants from teaching based on pay seemed to come primarily from teachers themselves.

Monica recalls telling her English teacher, "one of her favorite teachers," "I think I want to go into education." Monica says, "He was like, 'Why? Don't.'" Monica heard similar advice from her aunt, also a teacher, and says that everyone who gave her this advice focused on money, even the teachers who liked their jobs. Monica says, "They would be like, 'Oh, yeah, I love teaching, but you don't make that much, so you probably don't want to become a teacher.'" Even

though Monica remained doubtful that the money would be as important to her as it seemed to be to those she was receiving advice from, she did consider other career options as a result of these comments. Monica describes thinking, “Do I really want to become a teacher if a teacher is telling me not to become a teacher? For a long time, I was like, ‘Alright, maybe I should look into like other things.’”

Taylor’s mom had also tried to talk Taylor out of the career, especially due to pay: “She’s like, ‘There are so many other things you could do that pay so much better.’” Teacher pay is also the primary reason Felicity received advice to pursue alternative math-related careers. This advice often came from her family members, namely her grandmother, who pointed out that teaching “isn’t a valued profession,” especially in North Carolina. Felicity explains that her grandmother’s reasoning came from a place of “want[ing] what is best” for Felicity: “I guess in her mind, having a good salary is one of those things that you need to be able to support yourself.” Even though Felicity’s family was ultimately supportive of her to enter teaching decision, Felicity says, “It still took some time to convince my family that I was accepting a very large pay cut to go into teaching.” Matilda also describes acquaintances and family connections expressing this concern in response to learning about her plans to teach: “People will tell me, ‘Wow, you’re not going to make a lot of money.’” Matilda says, “I’ve had people ask my mom, ‘Are you okay with her doing that? Why are you letting her become a teacher?’”

Each participant considered ways to navigate this advice. Frequently, participants pointed out differences between the teachers sharing this type of advice and themselves, creating a cognitive distance between their own life circumstances and those expressing concerns about teacher pay. Because Monica’s family had limited money while she was growing up, Monica does not expect to have difficulty making ends meet on a teacher’s salary since she is used to living on a tight budget. Monica and Zoe both noted that the teachers who tried to talk them out

of the profession using pay as a justification had children and/or were supporting their families. Zoe explained, “The pay thing was really bothering them but that’s not something that gets to me... I had kids or if I had a husband, I’d be more worried about it, but it’s just me.”

Job constraints: “Worried about administration.” While social persuasion not to enter teaching was largely focused on teacher pay, Victoria had also received advice not to enter teaching from teachers themselves, but for another reason: school administration. As a high school student, Victoria took CTE education classes and had a full internship year in elementary school classrooms where she got to know the teachers well. Throughout this time, Victoria says teachers would “try to steer [her] away” from teaching during conversations about their jobs:

I remember one day sitting down with a group of third grade teachers...they’re all sitting at this table and they all started stopping their conversations to look at me and be like “Are you really sure you want to do this?” I was like “Well, I mean, I think I am.” And then they start telling me all the horror stories of being teachers and they’re like “You have to do testing and all this stuff.” I’m like, “Thanks for letting me know, now I know to be prepared for it. I still want to be a teacher.”

Victoria says the teachers were especially “worried about administration,” as the teachers were “dealing with problems and trying to get them fixed and they weren’t able to be fixed.” Victoria was the only participant to discuss hearing this concern, which she attributes to the fact that administrative support, or lack thereof, is probably not something that most education students deal with directly but instead something that new teachers may be surprised about once in a full-time teaching position.

Physiological and affective states. The final source of self-efficacy according to Bandura is physiological and affective states, where people judge their own capacities by their emotions, with stress and tension as indicators of vulnerability to poor performance and positive

affect indicating enjoyment and success (Bandura, 1997). Like the dynamics described above, affective processes have a bidirectional relationship with self-efficacy, serving as both a source of self-efficacy and a product of it. People with high self-efficacy likely hold positive outcome expectations and perceive certain tasks as achievable, whereas others may focus on threats that increase anxiety and impair functioning (Bandura, 1994, 1997). In general, evidence of this theme was more limited than those above, perhaps due to a near-universal attraction to the profession based on inherently positive experiences and expectations related to feelings of fulfillment and reward associated with helping others. Because extrinsic factors associated with teaching may often serve as deterrents for the profession (namely teacher pay and a relative societal lack of respect for the profession, as described above), positive feelings associated with the work of teaching and helping is especially strong in confirming this career path for participants. The only theme related to physiological and affective states is Positive affect: “That is what I want to feel for the rest of my life.”

Positive affect: “That is what I want to feel for the rest of my life.” Participants consistently referenced positive emotions when discussing their teaching-related experiences and roles. Participants described feeling proud, fulfilled, inspired, and happy when helping others understand a concept, an indication of participants’ current success in their role as an educator, and positive outcome expectations for the future. Felicity described tutoring students through college as “easy,” summing: “[Tutoring] made me happy. I was really good at it,” then mentioning the pride she experienced meeting and working with all types of students, describing “enjoying” meeting new students who were “terrified of taking college algebra” and feeling “inspired” by the adult students who sought tutoring to finish their degrees. It was reflecting on these experiences at the end of her undergraduate years that made Felicity realize that she wanted to pursue a career in math education after all.

Several other participants described similar positive emotions experienced through tutoring and helping others. Both Taylor and Jenna reference proud moments when the students they were working with understood the concept they had been teaching. Taylor says:

There was this one girl in my neighborhood that I tutored. I loved explaining a problem to her and hearing her go, “Oh I get it now, we just do this and this.” And I’m like, “Yes.” I just loved that moment.

Jenna described a very similar experience:

When I did tutor, seeing that person finally understand the math concept or whatever I was telling them, I don’t know how to explain that feeling but that is what I want to feel for the rest of my life, someone getting that “aha” moment.

Matilda, too, expressed pride and excitement from helping a student learn a particular concept:

I really like when kids learn things, seeing that a kid actually gets something. I tutor a high schooler right now... I was like, “Hey, how’d your exam go?” He had an exam on Friday and he was like, “The average was like 70 and I got an 86 on it and it was the highest I’ve ever gotten in chemistry.” He was so excited and I was like, “Yay, that’s so exciting! I told you that you were smart, you did it.” I just really like that.

For Matilda, moments such as this one helped justify her decision to teach, a feeling that her parents encouraged that she pursue regardless of money:

[My family is] fortunate enough to be able to push the “you-should-only-be-doing-it-if-it-makes-you-happy thing.” If I had come from a different background, then it might be more about what am I going to do to be able to support myself, the money aspect of it, but my parents are really well off, so they’re more like, “Do what makes you happy. That’s the most important thing.” I just know that teaching makes me feel really happy. I tutor a lot and I have been a mentor for classes, and I do a lot of stuff actually helping

kids. It's just like when they finally get something and they look really happy about it and they're like, "Oh, I understand," that's so nice to see.

The positive emotional experience that participants had while teaching and in other helping roles was the primary motivation and source of interest in the profession for most participants, frequently outweighing any extrinsic factors or related negative social persuasion. In the examples above, these positive feelings were strongly tied to successful personal performance, with participants feeling happy and proud as a result of their ability to help others succeed. While positive affect universally contributed to greater interest in teaching among participants, Matilda additionally references the privilege of pursuing a career that makes her happy rather than one that pays well, which other students may not be able to do.

NCTFP Costs and Benefits, Bounded Rationality, and Student Decision Making

To frame findings for RQ3 related to the perceived benefits of the NCTFP and the ways in which these program factors influenced student decision making, I follow Wiemer's (2017) guide of framing decisions into a cost/benefit framework, then acknowledging findings related to behavioral economics concepts that demonstrate bounded rationality. Consistent with traditional economic theory, participants' respective decisions to participate in the NCTFP were based on perceived program benefits outweighing perceived costs, although these decisions were not always based on complete information or not always fully rational from an economic lens. All participants identified the financial support offered by the NCTFP as the strongest benefit related to the program. However, participants also identified secondary benefits for participation, including competitiveness for future jobs, access to enrichment activities, becoming part of a larger network and community, and having a concrete post-graduate plan.

While the most important benefit across participants was the funding associated with the NCTFP, the perceived costs of the program varied by individual. Based on the structure of the

NCTFP, the primary benefits of the program are experienced proximally (upfront forgivable loan money), while the primary costs (post-graduate teacher service) are experienced distally.

However, some participants made immediate compromises, including enrolling at institutions or in academic programs that may not have been their preferred choices for the primary purpose of meeting the NCTFP eligibility requirements, therefore experiencing proximal costs as well. As both incoming students and currently enrolled students are eligible to apply for the NCTFP, the order of commitments students make to their institutions, to their academic programs, and to the NCTFP is partially dependent on a participant's academic stage. Thus, the NCTFP had varying levels of influence on participants' college choices, academic majors and programs, and future plans based on participants' respective academic status and institution. Additionally, because participants are all committing to future teacher service obligations and/or cash repayment, all cost/benefit analyses are based on a limited knowledge of what the future will hold, including the interests, priorities, and credentials of participants' future selves, and the context of the job market at the time of their workforce entry.

Throughout narratives, instances of limited information, lack of understanding of program terms, and the use of simplification strategies illustrated bounded rationality in decision making. Part of these dynamics could be attributed to the accessibility of information provided by the NCTFP, and the way in which program information was framed, including the emphasis on the former NCTFP's strengths, a strategy that offers limitations given the differences between the former and current versions of the program and the lack of attention to the completion rates of participants in the former program. Time-inconsistent preferences also help to contextualize the high levels of confidence that participants expressed in their ability to meet all program requirements, even if requirements are unclear and in spite of evidence from other programs suggesting the likelihood of noncompletion. Table 5.2 presents themes related to RQ3 sorted by

costs, benefits, and areas of bounded rationality, including the somewhat neutral costs of applying to the program, the financial and non-financial benefits identified by participants, proximal and distal costs related to NCTFP participation and related post-graduate service requirements, and bounded rationality, including information access and processing, framing effects, and time-inconsistent preferences.

Table 5.2

Rational Choice and Bounded Rationality in NCTFP Participation Decisions

Category	Theme	Subtheme
Neutral	Neutral cost of applying: “Why not?”	
Benefit	Financial benefits: “You need to take the money”	College choice: “Teaching Fellows covered all of my expenses”
		Continuing students: “Cut down my debt as much as possible”
	Non-financial benefits: “So much more to be excited about”	Job search: “It’ll look really good on my resume”
		Enrichment: “The amount of opportunities I get”
Cost	Proximal costs: Academic decisions	Community: “I wanted to be part of a cohort of future teachers”
		No proximal cost: “Everything aligned so well”
		Influence on subject: “Teaching science is not that bad”
	Distal costs: Post-graduate service	High proximal cost: “I just had to put that aside”
		Teaching because of the NCTFP: “I’m just going to teach real quick”
Bounded rationality	Information access and processing	Staying in state: “Teachers in North Carolina don’t get paid very well”
		Lacking information: “Going in blind”
		Lack of understanding: “I don’t exactly know what that means”
	Framing effects	Simplifying decisions: “It gave me something concrete”
	Time-inconsistent preferences	Reputation: “A recognizable name”
		Present bias: “My story isn’t going to be the same”

As a result of participants entering the NCTFP at different points in their postsecondary education, the NCTFP had differential influences on college choice, major choice, and future plans. For five of the six participants who were choosing institutions at the time they applied to the NCTFP, getting into the program had at least some impact on their college choice, whether it enabled the participant to justify attending a top choice institution that became an NCTFP partner campus or opened up new, and more financially viable, postsecondary opportunities.

Of all ten participants, six did not alter their academic plans at all for the NCTFP, as they had already been planning to enter an education major in a STEM subject (Taylor, Jenna, Matilda, Kristen, Kyle, Felicity). This group includes all of the participants who were already enrolled in college at the time of their application to the NCTFP, meaning that the program was seemingly more likely to influence the academic plans of participants who applied as incoming students. Although he was planning to major in STEM education Kyle, however, was not necessarily planning to enter a career in teaching. As a result, even while the NCTFP did not influence his academic plans, the program is critically influencing his post-graduate plans.

For the four participants whose academic plans changed as a result of the NCTFP, the program narrowed participants' subject area interests, or provided sufficiently compelling benefits for participants alter original career interests and plans. Christy had originally planned to attend college out of state to study computer science but was compelled to join the NCTFP by her parents, who were attracted to the fact that the program would allow her to obtain a bachelor's degree in a technology-focused subject area without taking out student loans. For Christy, then, the NCTFP directly influenced her college and academic choices, with direct implications for her longer-term career plans. The remaining three participants who made changes to their academic plans as a result of the NCTFP (Monica, Victoria, Zoe) had all already planned to teach but opted to prepare for careers in STEM education as a result of the benefits

offered by the NCTFP. Table 5.3 provides an overview of the influence of the NCTFP on students' college and career plans.

Table 5.3

Influence of the NCTFP on Participants' Academic Plans

Pseudonym	Class Year	NCTFP Influenced College Choice	NCTFP Influenced Enrollment in Teacher Preparation Program	NCTFP Influenced Enrollment in STEM- Related Academic Program	NCTFP Influenced Plans to Work in NC	NCTFP Influenced Preferred Type of School to Teach In
Monica	First-Year	No	Somewhat	Somewhat	No	Unsure
Victoria	First-Year	Yes	No	Yes	Yes	Somewhat
Taylor	First-Year	Somewhat	No	No	No	Unsure
Christy	First-Year	Somewhat	Yes	No	Yes	Unsure
Zoe	First-Year	Somewhat	No	Yes	No	No
Jenna	Sophomore	No*	No	No	No	Unsure
Matilda	Junior	No*	No	No	Somewhat	Unsure
Kristen	Junior	No*	No	No	Somewhat	No
Kyle	Junior	No*	No	No	Somewhat	Somewhat
Felicity	Master's Student	Yes	No	No	No	No

Note. *Indicates students already enrolled in NCTFP partner institutions prior to the announcement and implementation of the NCTFP.

Neutral cost of applying: “Why not?” The perceived costs and benefits of both applying to and participating in the NCTFP are framed in part by the way in which students first learned about the program. Five participants learned about the program through teachers, counselors, and professors in their current and prospective schools and institutions (Monica, Victoria, Taylor, Kristen, Felicity). Christy learned about the program through her mom, a high school principal at the time the news came out. These participants who learned about the program and who were encouraged to apply by others may have perhaps received some benefit to self-efficacy through the social persuasion inherent in this encouragement. The remaining four

participants learned about the program from online sources or through listserv emails sent through their respective academic programs (Zoe, Jenna, Matilda, Kyle), thus, not through targeted information sources. Table A3 (Appendix M) details the various ways in which participants learned about the NCTFP. To apply, participants completed an electronic application including short answer/essay questions about their interest in teaching and submitted SAT or ACT scores and a high school and/or college transcript (NCTFP, n.d.). There is no financial cost associated with applying.

In general, the cost of applying to the program seemed negligible or neutral based especially on participants' lack of information about the new program size's, selectivity, the amount of money they would receive if accepted, and the enrichment opportunities. Several participants expressed that they and their parents were frustrated by the lack of information available at the time of application, which was commonly attributed to the fact that the program was brand new at the time. Still, any time costs of applying were perceived to be worth the potential to be accepted and receive benefits. Several participants had expected the program to be highly competitive and were thus "shocked" (Matilda) when they were admitted. Victoria had thought the program was probably "very select" for "just a few people" and remembers thinking, "There's going to be 10,000 applicants, and they're going to pick five people and there's no way I'm going to get this." Indeed, even at the time of this study there is no information in the program's marketing for how many students will be admitted per year (NCTFP, n.d.). According to the UNC System Communications (2017, para. 6), the program has a capacity for "roughly 160 future teachers per year," with the actual program maximum at 130 based on a need for allocating some funding for covering statewide enrichment activities for Fellows (S. Ulm, personal communication, January 29, 2019).

In addition to uncertainty about competitiveness, Matilda mentioned an uncertainty about how much money she would receive, since the amount participants are eligible for is “up to \$4,125” a semester (NCTFP, n.d., para. 1). Matilda says she “assumed that they were going to give [funding] on a scale,” with the top applicants receiving the most money. Matilda makes a comment about receiving the full amount of money but not being sure how much other Fellows had received, indicating a lingering uncertainty on how the funding was awarded: “I don't know what other people got. They gave me all of it.”

Financial benefits: “You need to take the money.” Across all participants, the most compelling part of the NCTFP was the loan forgiveness offered by the program. Because NCTFP participants are at different stages of their academic programs, the role of the NCTFP in offsetting college costs varies. For students making enrollment decisions for undergraduate and graduate programs at the time of their applications to the program, the NCTFP seemed to play an important role in students’ and families’ analysis of postsecondary options and affordability. For those participants already at partner institutions, the NCTFP offered an ideal strategy for cutting down anticipated student debt and for the student taking greater ownership over their college costs in the cases where parents were covering college expenses. While the financial benefits were consistently students’ top motivations for applying to the NCTFP, some participants listed additional secondary benefits as well, although these were less understood by participants, especially at the time they first applied.

College choice: “Teaching Fellows covered all of my expenses.” For the six participants in this study making decisions about which institutions to attend at the time of applying to the NCTFP (incoming first-year and master’s students), the NCTFP was critical to weighing the affordability of institutional options. For first-year students Monica, Taylor, and Zoe, their respective top choice institutions happened to become NCTFP partner campuses. For Monica,

the college decision would come down to “who was going to give [her] the most money,” which ended up being the NCTFP partner institution that she ultimately chose. Monica comments that this institution actually turned out to be her lowest cost option among the schools she was considering (all public) even without the NCTFP. Taylor and Zoe both aspired to attend specific private institutions and, in both cases, the NCTFP had a critical impact on their ability to afford tuition at these top-choice schools. For both Taylor and Zoe, the NCTFP forgivable loans were one source of financial aid out of several that helped offset the higher private school price, enabling both students’ attendance at the institutions they wanted to attend.

For Victoria and Felicity, the NCTFP forgivable loans played a critical role in helping them to choose institutions that would keep their college costs low. Victoria, a first-generation college student, was highly sensitive to college costs and worried about her ability to afford a four-year institution. Victoria had already excluded her top choice institution, an out-of-state public institution, from her college options because the cost was too high. Instead, Victoria was considering starting her postsecondary education at a community college. After considering the NCTFP, Victoria applied to two partner institutions, including one institution near her home. Although Victoria hadn’t received any other financial support for college, the NCTFP enabled Victoria to commute from home to save money while attending a four-year institution. Although this institution wasn’t Victoria’s first choice and although she made other sacrifices to participate in the NCTFP (choosing a STEM subject area), Victoria perceived the financial benefits of the program to outweigh the costs in enabling her to attend a four-year institution.

For Felicity, the only master’s student in the study, the NCTFP played a significant role in reducing the costs of her graduate education. Although Felicity had received a full scholarship for her undergraduate education, she was concerned about the cost of graduate school: “I had told myself that since I didn't have to take out any loans in undergrad, if I had to take out loans

for this one year, so be it. It wouldn't be the end of the world." Felicity began looking for one-year MAT programs in North Carolina and identified three institutions that offered a master's program fitting this structure, including one institution near her home where she could commute and save money. Another institution that Felicity had applied to become an NCTFP partner institution and also offered her a merit-based assistantship that covered her full tuition and fees for fall and spring semesters. Between receiving the assistantship and being accepted to the NCTFP, Felicity chose the institution that offered both aid sources, allowing her to take out "only a little bit of a loan" to cover her living expenses and other remaining costs to move away from home to complete her master's degree.

Christy is the final participant who was making college decisions at the time of learning about the NCTFP. Like Victoria, Christy hoped to attend an out-of-state public institution and had actually planned to attend; her family had even put down a deposit on this school. Christy's parents, however, became increasingly concerned about the cost of college and "on the last day you can decide" told her to attend the institution in North Carolina that had the NCTFP. Christy says that this decision "really came down to the financial aspect" and that her parents did not want her to take out loans, even though she was okay with doing so in order to attend her top choice institution. Although staying in state and attending the NCTFP partner institution was not Christy's personal choice, she took solace in the fact that she could study technology education, especially after a dean at the institution called her to talk further about the program. For Christy, the NCTFP had a direct influence on her college choice, even if the decision was largely that of her parents. As a result of the NCTFP funding, Christy's family is able to cover her remaining college costs and she doesn't anticipate needing to take out any loans to pay for college.

Continuing students: "Cut down my debt as much as possible." Four students in the present study are continuing students who were already enrolled in a partner institution at the

time the NCTFP was announced. All of these participants were already enrolled in STEM education program. Although the NCTFP funding didn't influence the college or major-related decisions of these four participants, it still remained the most attractive benefit for each participant's interest in the program. Kyle, who has already had taken out "a decent amount" of student loans, saw the opportunity to receive significant financial support as a way to "cut down [his debt] as much as possible." Unfortunately, Kyle applied to the NCTFP and accepted the invitation without realizing that the NCTFP funding was in the form of forgivable loans with post-graduate requirements attached—instead, he had thought he was applying for a scholarship. Jenna, a first-generation college student and current sophomore, had applied to many scholarships, looking for any financial support available to reduce her college costs. Jenna describes being "so excited" to learn that she received the NCTFP. However, Jenna only recently realized that, as a continuing student, she is only eligible for two years of funding despite having three years left of her undergraduate education.

Both Kristen and Matilda come from higher-income backgrounds than Jenna and Kyle, although both students were also motivated to join the NCTFP to reduce their college costs. While Matilda's parents "have a lot of money" and were covering her college expenses, Matilda felt strongly about trying pay her own way through college as much as possible and sought NCTFP financial support to meet this goal. For Kristen, money was a factor in her initial college choice, with the private Teaching Fellows program, and its accompanying financial support, factored into her original college choice decision. When her institution was announced as an NCTFP partner campus, Kristen was also most interested in the financial benefits of the program: "\$16,000, that was a huge attraction to me...I told my parents how much it was and they were like, 'Yeah, you're applying to that.'"

Non-financial benefits: “So much more to be excited about.” The financial benefits were the most visible benefit of the NCTFP, especially given the “lack of information” available about the program when participants first applied “because it was so new” (Taylor). Some participants recall trying to find information about the program when they made their initial decisions about participation, but information was limited, especially for the public campuses that did not have established Teaching Fellows programs. Christy said that it was difficult to know about what it would be like to be a Teaching Fellow: “I know I had the financial help, but what else?” Even now, some participants express a limited understanding of the program especially since, at the time of the interviews for this study, none of the participants had yet attended an event sponsored by the statewide NCTFP; all enrichment activities to date have been through participants’ respective institutions. Most participants, especially those at private institutions with existing private Teaching Fellows infrastructures, seemed to differentiate their understanding of the NCTFP from their campus-specific enrichment activities, even though these activities are conducted as part of the NCTFP’s requirements for partner campuses. Victoria wasn’t alone in describing the program by saying, “All I know from it is that they give us money at this point,” even in spite of her regular participation in campus enrichment activities. Across interviews, participants often expressed an interest in there being more enrichment activities sponsored by the NCTFP for students across all partner institutions, especially Felicity who, as a master’s student in a one-year program, will not meet NCTFP peers on other campuses until the very end of her only year of participation in the program.

While information on non-financial benefits associated with the NCTFP may have been limited when participants applied, participants still identified non-financial benefits as a secondary incentive for applying to and choosing to participate in the program. Monica described, “At first it was a financial thing, but then there was so much more to be excited about

than just the money aspect of it.” These non-financial benefits included the perceived benefit of the program on students’ expected ability to get jobs, the opportunity to access enrichment activities, joining a larger community, and helping to simplify career decisions.

Job search: “It’ll look really good on my resume.” Non-financial reasons for participating in the NCTFP had to do with the program’s reputation. Several participants talked about the importance of having a strong resume when job searching. Both Matilda and Kyle acknowledged that they expected the program would “look good” on their resumes, ultimately helping them to land a job after graduation: “If I get this, it’ll look really good on my resume and maybe people will be like, ‘Oh, she’s a Teaching Fellow... we should give her a job because she has a lot of experience’” (Matilda). Kyle remembers thinking, “This is a nationally recognized program, it would be pretty good on a resume if I do decide to go into teaching.”

Both Kyle and Taylor described their Teaching Fellows experience as providing “job security,” by which both students meant that they would likely get jobs as a result of the program: “You pretty much graduate with job security in four years.” (Taylor). Kristen, too, says of the program, “I’ll almost positively have a job.” Both Kristen and Taylor mostly credit their private Teaching Fellows programs for their anticipated competitiveness on the job market, even though the enrichment activities they each participate in are technically for both their private programs and for the NCTFP. Although Kristen has found great value in her private Teaching Fellows program and has had comparatively less experience with the NCTFP, Kristen acknowledges that the NCTFP will likely help her job search within the state due to the program’s large existing network.

Enrichment: “The amount of opportunities I get.” Related to the theme above, participants were also attracted to the NCTFP due to the professional development and enrichment opportunities that they hoped the program would provide. The enrichment

opportunities were somewhat less visible to participants at the outset of the program when they first applied, especially for students at public institutions that were still building program infrastructure at the time of participants' application and acceptance to the program. For Zoe, Taylor, and Kristen who attend private institutions, the enrichment activities associated with the private Teaching Fellows program helped to generate their interest in their respective institutions in the first place, and to justify the costs of attending a private college. Monica, who attends a public institution, says that her interest in the program grew as she learned about the enrichment opportunities: "When I was getting information emails about the kinds of things you get to do with the program... At first it was a financial thing, but then there was so much more to be excited about than just the money aspect of it." Still, participants wish there was more. Jenna wishes there were more opportunities for engagement and wishes her institution had a larger program support staff since she sees that the campus director is stretched thin. Jenna compares her institution's program to what she knows of the opportunities on the private campuses, saying that she wished she had some of the same opportunities, such as support for studying abroad. Participants universally spoke highly of the enrichment activities they have participated in so far but also look forward to the continued growth of these opportunities, especially at the state level across all partner campuses.

Community: "I wanted to be part of a cohort of future teachers." For several students, the community offered by the NCTFP offered an additional benefit for applying and participating in the program. For Jenna, this component was an especially strong incentive even though she was already active in teaching-related organizations both in high school and in college, including an education-themed living learning community and a professional association for teaching. Jenna saw the NCTFP as a way to become a part of an even narrower network that fit her interest precisely, future teachers in STEM education. Zoe, too, was interested in the

program's potential to provide a supportive community, suggesting that she would like to see the NCTFP add a mentorship component between former and current Fellows. While participants have appreciated the opportunity to meet their classmates on their own campuses, with participants like Monica and Kristen attributing the program to meeting some of their closest friends, participants consistently vocalized an interest for additional community-building opportunities, especially across institutions and with current teachers and alumni of the original NCTFP.

Proximal costs: Academic decisions. While participants largely agreed on program benefits, which they all currently receive in the form of upfront funding and various enrichment opportunities, the costs of participating in the program vary sizably between participants. Because the program funding is provided in the form of forgivable loans that must be paid back in post-graduate teacher service, the universal costs associated with the NCTFP are distal. By contrast, proximal costs are individualized, directly related to the decisions participants made to join the program, especially when decisions led to compromising other interests or goals. For some participants, these costs were minimal because they had already planned to attend a partner institution, pursue STEM education majors and careers, and to teach in North Carolina. For those who had not originally planned on these paths but who committed to them as a result of the NCTFP, proximal costs were perceived to be more significant.

No proximal cost: "Everything aligned so well." Currently, the NCTFP is designed to serve as a teacher recruitment tool, restricting students already enrolled in teacher preparation programs from applying to the program. However, nine of 10 participants in the present study were either already enrolled in education majors or planned to be (Christy as the exception), and seven of the nine were already enrolled in, or planned to enroll in, education subject areas targeted by the NCTFP (Victoria and Zoe as the exceptions). As each institution's education

program is configured differently, some education students were eligible for the NCTFP because, although they were involved in education academic programs, they had not yet reached the formal teacher preparation phase of their academic program at the time of their NCTFP application. Other programs are structured so that students major in their subject area specializations instead of in education, also making them technically eligible for the NCTFP.

Five of the 10 participants (Taylor, Jenna, Matilda, Kristen, Felicity) say that they would have become STEM education teachers regardless of the NCTFP, with Monica additionally entering either special education or STEM education regardless of the program. For these students with existing interests in STEM and special education, the proximal costs of joining the NCTFP were minimal, especially because these students were also already enrolled in, entering, or were at least already considering attending the partner institutions and teaching within the North Carolina after their graduation. While the NCTFP may give shape to these participants' post-graduate plans, these participants overwhelmingly saw the program as a benefit that aligned with and supported their pre-existing plans and, therefore, there was very little perceived cost to applying.

Influence on subject: "Teaching science is not that bad." For two participants, Victoria and Zoe, the biggest cost of participating in the NCTFP was becoming a teacher in a different subject, and at a different level (for Victoria), than originally planned. Both Zoe and Victoria had planned to enter teaching prior to the NCTFP, although neither was originally interested in teaching STEM. Zoe had originally hoped to teach language arts and/or social studies, while Victoria had been interested in teaching elementary education. However, both Zoe and Victoria saw the NCTFP funding as too great of an opportunity to pass up in meeting their college-going goals, even if it meant compromising subject area interests.

For Zoe, the NCTFP funding allowed her to afford her top-choice college, a private institution. For Victoria, the NCTFP allowed her to attend a four-year institution. Even though Zoe “doesn’t like science,” she always did well in the subject and has a personal connection to science education through her grandfather’s career. Although Zoe plans to teach science to meet her NCTFP service requirements, Zoe could see herself seeking licensure in her preferred subjects after completing her NCTFP service.

The decision to change subject areas to fit the NCTFP was especially difficult for Victoria. Like Zoe, Victoria had done well in both math and science throughout her education, but she did not have a strong interest in, or connection to these subjects. Instead, Victoria had been set on becoming an elementary school teacher. Victoria recalls asking herself, “Am I sure I want to change up my entire career path just for a scholarship?” and sought guidance from multiple mentors in her life in making this decision. Victoria’s parents focused heavily on the financial benefits of the program, telling her to “take the money, take the money.” To get a different perspective, Victoria sought the advice of her high school guidance counselors, who helped her contact institutions to gather additional information to make a more informed choice. Victoria is currently preparing to become a middle grades teacher and is still deciding between teaching science or math.

While the NCTFP also shaped Monica’s ultimate commitment to enter science education, Monica had already been considering both science education and special education, the two subject areas of the NCTFP. Monica had initially selected special education but later switched to science education once she enrolled in college and learned that the institution she had selected did not have a special education program for undergraduate students. Thus, while the NCTFP shaped Monica’s pathway toward science education, Monica would have likely entered teaching in a subject area targeted by the NCTFP regardless of the program’s existence.

High proximal cost: “I just had to put that aside.” The student with the highest proximal cost for participating in the NCTFP was Christy. Christy is the only participant who changed every facet of her plans to fit the NCTFP, although these decisions were not necessarily her own. Christy had planned to attend an out-of-state institution with a large athletic program that was near extended family and planned to study computer science. Although Christy’s parents originally supported these plans and even put a deposit down for the institution, bought plane tickets for her move-in, and more., they changed her mind in the last minute due to escalating concerns about the cost of Christy attending an out-of-state institution. Christy’s parents did not want her to take out loans and, if she attended college in-state and as part of the NCTFP, her parents could cover the remainder of her college costs.

Christy was “very upset” about this change in plans although she felt better about the decision after receiving a call from a dean of the NCTFP partner institution. Christy and the dean talked about the technology education program and the opportunities it offered, with the two also discussing how the experience would be for Christy as an African American student in the program, especially in the context of a White student body at the institution, and the academic program. For Christy, the NCTFP offered the benefit of attending college and studying technology without having to take out additional loans, even though the program is also setting her up for a career in teaching. Although Christy perceived the proximal costs for her participation in the NCTFP to be high, she speaks very positively about her experience in her major and in the program so far and she says she looks forward to becoming a teacher, even if she opts not to stay in the field, or in the state, long-term.

Distal costs: Post-graduate service. By committing to participate in the NCTFP and receiving program benefits, all participants have also committed to paying back the forgivable loans they receive in college through eligible teaching service at a public school in North

Carolina in STEM education, or by paying loans back in cash with interest. To pay loans back in service, participants must teach for at least one year at a low-performing school for every year of funding received or teach for two years at a school not considered low-performing for every year of funding received. Thus, students' commitments vary based on the years of funding they receive and the type of school where they ultimately choose to teach. While receiving more years of funding results in greater proximal financial benefits, the distal costs are significantly higher as well. Felicity, for instance, will only receive one full year of funding, which translates to a maximum commitment of two years of teaching service. By contrast, first-year students on track to receive four years of funding will hold a *minimum* commitment of four years of teaching service if they choose to enter low-performing schools, eight years if not.

The construct of time-inconsistent preferences is especially important to contextualizing these findings, especially because participants' future employment details, including school location and type are speculative at this point, a limitation of the present study. Even for the two participants who have already signed contracts with school systems within the state (Felicity, for after her upcoming graduation, and Zoe as part of a Future Teachers Program, both for systems participants attended themselves), neither know the characteristics of the specific schools where they will eventually teach.

Teaching because of the NCTFP: "I'm just going to teach real quick." As displayed in Table 5.3, eight participants in the present study had already seriously considered teaching careers prior to learning about the NCTFP. While Monica had still been considering other career options at the time of learning about the NCTFP, she thinks it was likely she would have become a teacher anyway; this career was high on her list of options and her existing interest in the career was the reason her high school guidance counselor told her about the NCTFP in the first place. For Christy and Kyle, however, joining the NCTFP to get money towards college costs was a

critical impetus in both students' current plans to teach after their college graduations. Christy and Kyle are both enrolled in technology education programs and both believe their educations to be preparing them not only for careers in teaching, but also for careers in industry as well.

Education and teaching had a large presence in Christy's life through her mother's career, although Christy had never seriously considered this career path for herself. It wasn't until Christy had been accepted to the NCTFP and until her parents told her that she needed to stay in state and take this aid source that Christy began to consider a career in teaching. While Christy now sees herself entering teaching to pay back her forgivable loans via service, she doesn't necessarily see herself staying in teaching long-term, although she is open to the option. Instead, after her teaching service, Christy is especially interested in entering the technology field, possibly via her extended family's business in cybersecurity.

Kyle, too, changed his plans entirely once he was admitted to the NCTFP. Kyle entered a technology education program at the advice of one of his college professors in technology, although he did not plan to become a teacher even at this time. Once hearing about the NCTFP, Kyle applied to the program for the financial support, not realizing that the funding was in the form of forgivable loans. It wasn't until after he accepted the award that Kyle began to seriously think about teaching in order to actualize the program's financial benefits, which will help him reduce his student debt. Even though he is now seriously considering teaching, Kyle is the only participant who expressed an interest in applying to non-teaching positions right out of college to see if he may receive a higher salary in a field of greater interest, thus perhaps justifying the decision to pay the NCTFP loans back in cash. Even if he does enter teaching initially, Kyle does not anticipate staying in the field long-term.

Staying in state: "Teachers in North Carolina don't get paid very well." As participants consider their future career paths, the NCTFP compelled four participants to plan to stay in the

state after their graduation, at least short-term while they complete their teaching service (Victoria, Christy, Matilda, Kristen). Two participants, Zoe and Felicity, have already signed contracts with systems within the state for the short-term, both in the systems that they themselves attended.

Throughout interviews, perceptions of North Carolina schools and of teaching in the state were largely negative; much of the dissuasion that participants encountered related to becoming teachers was compounded by advice about the relatively poor teacher pay or teaching conditions within the state. After Taylor's mom began to accept her plans to become a teacher, she encouraged Taylor to look for jobs outside of their county and, ideally, out of state: "Just teach somewhere that isn't where we grew up, because they're one of the worst counties in North Carolina for pay'... She tried to get me to move up north, because that's where they pay." Felicity's family also tried to talk her out of pursuing a teaching career, especially within North Carolina because "North Carolina has had some bad decisions as far as teachers go." Felicity's family also cited the conditions of teachers within the state as a reason for her not to enter the career: "They were like, "Well, teachers in North Carolina don't get paid very well. It's not a valued profession in North Carolina."

Several participants still see themselves leaving the state as soon as they complete their service. Victoria describes:

Teachers in North Carolina just don't make enough money in order for me to feel like I could make a living for myself and enjoy my life... That was something that's always been pressed into me: "Do not teach in North Carolina. Do not do that."

When Kristen, the only participant who moved to North Carolina to attend college chose her institution, it hadn't occurred to her that her education program would prepare her for teaching licensure in North Carolina. Although Kristen may have stayed in North Carolina to teach short-

term even without the NCTFP due to the location of her licensure, the NCTFP confirmed these plans, giving her more specific parameters for her first job after graduation. Kristen's ultimate goal is to teach at the school that she attended, although she and other out-of-state peers see their licensure as an opportunity to give back to the state: "North Carolina public schools aren't the best, so we want to help that. We want to help improve them...we believe that our education at [institution] will give us the ability to help them."

In addition to North Carolina's relatively low teacher pay, Matilda and Jenna also both brought up the state's current lack of incentive pay for teachers to get their master's degree. Jenna still aspires to get this credential, even if the financial incentive is not offered by the state. Matilda also plans to get her master's degree and is already affiliated with a master's program. North Carolina's lack of compensation for this credential is Matilda's primary motivation for planning to move out of state after her NCTFP service: "The one thing that gets me about North Carolina and the reason I'm going to leave...is North Carolina doesn't have master's pay for teachers anymore."

The only participant who spoke positively about teaching conditions in North Carolina was Christy. Christy's mom has been in education positions in North Carolina throughout Christy's life and, through her mom, Christy has witnessed some of the difficult parts about being a teacher, particularly at a low-performing and low-resourced school. However, Christy has also had some exposure to current policy within the state through her own work as a North Carolina Page, where she saw people working toward a bill for expanding public funding for schools in her county. Christy has also had the opportunity to meet with politicians as part of her institution's NCTFP activities, which has also fostered optimism for the state's political attention towards teachers. With her mom interested in entering the political scene in the state, Christy and her mother are both optimistic about change, which is one of the reasons her mother

recommended that Christy apply for the NCTFP in the first place, saying “there are going to be a lot of changes going on with teachers in the future.”

Bounded Rationality

While many of the decisions made by participants may be the result of seemingly rational choices, there are practical limitations to participants’ decisions that demonstrate bounded rationality in decision making. Themes related to bounded rationality include information access and processing, framing effects, and time-inconsistent preferences. Information access and processing refer to participants’ lack of knowledge or understanding of critical components of the NCTFP that limited their ability to weigh all costs and benefits. This theme additionally acknowledges NCTFP participation as a strategy to simplify complicated postsecondary decisions. The second theme, framing effects, refers to the way in which the NCTFP was presented as a nationally recognized and successful program, despite the program’s new format and status. The final theme in this section is time-inconsistent preferences. This theme refers to participants’ limited abilities to realistically anticipate and predict the wants and needs of their future selves, workforce dynamics and opportunities, and an overconfidence in their ability to meet all program requirements.

Information access and processing. While rational choice theory assumes that decision makers have perfect access to and comprehension of information, behavioral economics research shows this is often not the case. This is especially true in situations where people may be faced with a host of complicated options, as often occurs in postsecondary and financial aid contexts (Dynarski & Scott-Clayton, 2006). Three subthemes make up this theme: Lacking information: “Going in blind,” Lack of understanding: “I don’t exactly know what that means,” and “Simplifying decisions: “It gave me something concrete.”

Lacking information: “Going in blind.” One challenge to rational decision making evident within participants’ narratives was a lack of complete information about the NCTFP. Most participants made decisions to participate in the program while missing critical pieces of information that have had, or will have, a substantial impact on actual participation costs. In these instances, participants did not know what they did not know; they realized they had been missing information only *after* committing to the program, even if the information had been available.

The most extreme example of lacking information was Kyle’s interpretation of the NCTFP as a scholarship program instead of a loan forgiveness program. When he first learned about the NCTFP, Kyle read about the program but did not see details about the loan forgiveness structure. Although he did not recall coming across anything with this information, Kyle acknowledges that he did not read about the program deeply. Kyle says: “It might have been my fault for not reading too much. I just saw, ‘Oh they’ll give you \$8,000-something a year. I was like, ‘Alright, the less money I have to pay back, the better.’” As a result of this understanding of the program, Kyle perceived a very low cost in applying and participating; his newly formed plans to study technology education already aligned with the program’s requirements and he saw the program as a source of “free money” to help keep down his college costs. Kyle describes this experience as “going in blind.” Kyle says, “I knew I probably should have done more reading about it, but I didn’t.” Reflecting on this experience, Kyle thinks he may have applied to the NCTFP even if he had known it was a loan forgiveness program because, as he explains, “A pretty big part of college is finding money to be able to do it without driving yourself so far into debt that you can’t come back from it.” Kyle has been looking for other loan forgiveness options that he may be eligible for if he does enter a teaching position out of college.

While all other participants understood the loan forgiveness nature of the program, other pieces of information were lacking from their decisions as well. Jenna, the only sophomore participant in the study, had expected to receive funding for three years while she completed her undergraduate degree. However, halfway through her first year, Jenna found out that she is actually only eligible for two years of funding:

I recently found out that I'm only getting the scholarship for this year and next year, because I'm technically considered a transfer student because I was already in the college when I applied for it. But I wasn't officially an education major. I was a pre-education major, because I wasn't admitted into the major yet. So, I only get the scholarship for two years, which I didn't know. But now I know.

Jenna says “There's some option for three [years of funding]. I'm not sure what that one is, but I know I get two.” Jenna found this out when her program leader mentioned it during a Teaching Fellows seminar class, with the information coming as a surprise to other students as well. Jenna was “bummed” to learn this information and says her mom also “wasn't too happy” to learn that she would receive one less year of funding than she originally anticipated.

A final example of lacking information is Monica's story about choosing schools and academic programs. An incoming first-year undergraduate student when she accepted her invitation to participate in the NCTFP, Monica had assumed that all NCTFP partner institutions had both STEM and special education academic programs. Monica enrolled in her top-choice institution planning to study special education, only to realize that the institution did not offer an undergraduate special education program: “I just assumed that when I had read the Teaching Fellows thing that all the schools had all the programs that were on there.” Monica says:

I think the communication wasn't there. I had to figure that out on my own, no one was telling me, “Oh, you know they don't have special ed here.” But on everything that had

Teaching Fellows, the five partner schools, it said, “Oh, there’s special ed.” But then when I came to [institution] it was like, ‘Actually, we don’t have that.’”

Monica “figured [this] out by [herself]” once she contacted the institution. Because she had also had an interest in science education, Monica was not upset by this situation but instead says she “took it as a sign.” Monica explains: “I wasn’t really sure what subject area I wanted to go into so I feel like it decided for me, which was good in a way, but also, it would have been nice to have the option.”

Lack of understanding: “I don’t exactly know what that means.” While the subtheme above refers to situations where participants made decisions while missing knowledge about certain aspects of the NCTFP, this subtheme refers to a limited understanding of policy aspects that participants may have been aware of but did not fully understand.

Expected timeline of repayment. One component of the NCTFP that remains unclear for participants is whether teaching service must begin immediately after degree completion or whether Fellows can do their service at any point during a 10-year payback window. Matilda interpreted the policy as requiring service immediately after degree completion, but she plans to defer her service for one year while she pursues her master’s degree:

I think I understand [the NCTFP] pretty well. The one thing that I have talked to the [institution] program advisors with...I just know that I’ll have to contact them...because you’re supposed to pay it back as soon as you start but I’ll just have to contact them and be like, “Hey, I have one more year.” So, I can defer the payment, be like, “I have one more year, but I start the year after.”

Although she had originally interpreted the policy differently, Kristen now has a similar interpretation as Matilda. Kristen says, “Originally, the way it was perceived for us was that we

had 10 years to pay it back.” Now, Kristen believes that teacher service is expected to start immediately after graduation but could potentially be deferred for “academic” commitments:

We have 10 years to pay back the loan, originally I thought I could teach somewhere else for a few years and then do [the NCTFP service], but when I was signing the contract it sounded like I could either do this, teach in North Carolina right away, or do something academic, the Peace Corps, AmeriCorps, Teach for America, grad school, things like that. That took me the longest to try to figure out, I sent it to my parents, asked other friends who were applying to see how everyone understood it.

Even after sending the policy language to multiple people, Kristen remains somewhat unsure. She says figuring this out has been the most confusing part of the program for her and her classmates: “That was the biggest thing. There were a few of us that were very confused.”

Unlike Matilda and Kristen’s current understanding, Kyle has interpreted the policy to mean that he can complete his required service at any point during the 10-year window:

I do have 10 years to complete the years that I have to teach, so I could potentially do a few [years] at an engineering or architecture firm and then decide, “Oh, I’m just going to teach real quick and come back after that or something like that.” I do have a lot of flexibility, luckily, so it just kind of depends on which opportunities present themselves when.

These data suggest that this component of the policy remains unclear across participants, even now that students are active participants. For the reader’s reference, the official policy language states:

The [State Education Assistance Authority] shall forgive the loan and any interest accrued on the loan if, within 10 years after graduation from a program leading to teacher licensure, exclusive of any authorized deferment for extenuating circumstances, the

recipient serves as a teacher [in a qualified position]...If the recipient repays the forgivable loan by cash payments, all indebtedness shall be repaid within 10 years of completion of the program leading to teacher licensure supported by the forgivable loan. If the recipient completes a program leading to teacher licensure, payment of principal and interest shall begin no later than the first day of September after the completion of the program. Should a recipient present extenuating circumstances, the [State Education Assistance Authority] may extend the period to repay the loan in cash to no more than a total of 12 years (NCTFP, 2017, p. 30)

Language on the NCTFP website currently contains part of this content: “The loan principal and any accrued interest may be forgiven if, within 10 years after graduation from a program leading to teaching licensure, the Fellows services as a teacher in a qualified position” (NCTFP, n.d., “Loan forgiveness,” para. 6).

Understanding low-performing schools. A second source of confusion for participants is the definition of “low-performing” schools. Across interviews, participants commonly conflated “low-performing,” “low-income,” and even “Title I,” using the terms interchangeably. Participants also frequently expressed uncertainty about how low-performing school environments may differ qualitatively from other schools.

When I addressed the use of “low-performing” alongside other terms in second interviews, participants tended to report that they understood that the NCTFP incentivized their entry into low-performing schools, not low-income schools. Participants largely attributed this conflation of terminology to the commonality of the term “low-income” in other settings. Monica explains “I guess I was unconsciously using [the terms] interchangeably,” especially because she is currently working in schools that she believes may fit both categories: “I think it might also be that the schools that I work with in [city] are mostly low-income and low-

performing. So, I think I maybe just squished them together.” Taylor also explains that there is often overlap between schools in these respective categories: “I think the area that I grew up in, all the schools that were low-performing were also Title I.” Taylor also mentions that the distinction doesn’t matter too much for her right now since, as a first-year student, she is still years away from applying for teaching jobs.

Kristen also mentioned the overlap between schools considered low-performing and low-income and, despite having researched the low-performing designation when she first applied for the NCTFP, she remains unsure of this definition now:

A lot of times, I know low-performing and low-income are associated to be the same but they aren’t, necessarily. I believe that a low-performing school, I don’t really know if this is always a private school, schools with kids with learning differences, if there’s a school that’s focused on that, I don’t know if it is a charter school or anything...But just because they are low-performing doesn’t mean they are low-income.

The meaning and definition of a low-performing school was important to Kristen when she first joined the NCTFP and had planned to minimize her teaching commitments, but now that she is more open to staying in state regardless of the type of school she teaches at, the distinction is less important:

When I first thought about applying for North Carolina Teaching Fellows, I know I looked into [the definition]...I found the School Report Card website, just to see what the qualifications are to make it low-performing ...Originally I did think I was going to do two years just to get out fast, but just after time and growing up a little bit, I’d rather have the longer time, it doesn’t matter what type of school I go to.

Kristen describes doing “multiple hours of research” before coming across a list of schools categorized as low-performing. Kristen saved the list to her computer because it had been difficult to find, even though the list will be outdated by the time she enters the workforce:

I knew that I would lose it and have no memory of how I got it, which is true, I have zero memory of how I got it, so I remember being like I am not going to be able to find this again, I’m going to save it.

The actual definition of “low-income” is set by the state’s Department of Public Instruction, which provides performance designations to all public schools based predominantly school test measures and by comparing student performance to school expected performance using on a predictive model (NCDPI, n.d.).

Across conversations about the distinction between “low-performing” and “low-income,” Zoe was the only participant who openly expressed surprise at learning that the NCTFP incentivizes entry into low-performing schools, not low-income schools. In our first interview, Zoe had listed two schools she was especially interested in teaching at, two schools that she believed would fit the NCTFP criteria for faster loan repayment. When I looked up these schools, only one met the state’s definition of low-performing. Although she was surprised to learn about the “low-performing” focus of the NCTFP, Zoe says this information will not necessarily change her interest in teaching at the schools that she had originally identified. Instead, Zoe says “I’m happy to go anywhere that needs any kind of help”

In addition to a lack of clarity on school performance distinctions and definitions, some participants expressed a lack of understanding about what teaching in a low-performing school might entail. While most participants expressed an interest in teaching in schools where they can make the biggest impact, participants were also unsure of how these environments may influence their experience, and their success as teachers. Most participants did not feel like they had

enough information to make decisions about school preferences; the type of school they would pursue employment at was usually the least developed facet of participants' current career plans. As an example, when asked if she planned to teach in a low-performing school, Jenna responded: "I'm not sure yet, because I don't totally exactly know what that means. I feel like I should, but I don't." Monica, too, expressed limited knowledge and experience with these distinctions:

I don't come from [an area with] a lot of low-performing area schools. So, I had never really even been in one or seen what they're like. I've only heard speakers talk about how their schools lack enough funds to do things but I've never actually even it firsthand.

Matilda also had not attended a low-performing school and is also unsure whether she has enough information to make a decision about the type of school where she will pursue employment:

The idea of working in a low-performing school and helping kids and serving kids that really need a positive role model and someone to help them in life, that is everything that I'm passionate about, but I just don't know if I'm good enough to do it. I think I'll find that out after I student teach.

Other participants had a stronger understanding of these environments, whether through their own experience as students (Zoe and Kyle), through the accounts and advice of the teachers in their lives who had worked in multiple environments (Christy and Taylor), or through school visits and work. Victoria says that until she began doing classrooms observations while in college, she had never been exposed to low-performing school environments: "Before that I thought every school was like my school. Because that's what I grew up in. I was like 'Why wouldn't everything be like this? I mean, what else is there?'"

Christy, too, had only attended high-performing schools, but she had gotten a sense of the environment at other school types through her mom's experience as an educator:

I've always attended a high-performing school, so I know what goes on in those schools...But my mom, she was a principal at a low-performing school. I know she struggled a lot with trying to get funding for the school and different things that the students went through. I see the good and bad in both. My mom is able to tell me exactly how it's going to be for me as a teacher if I went to one school over another.

For all students except Felicity who had already accepted a job in a school system that doesn't have any low-performing schools, these decisions remained uncertain and participants' ideas about future plans were based largely on limited sources of information.

Simplifying decisions: "It gave me something concrete." For some participants, choosing to participate in the NCTFP offered a strategy for simplifying otherwise multifaceted and complex decisions in choosing majors and careers. The opportunity offered by the NCTFP constrained decisions in ways that may not be fully economical or rational, but that helped participants narrow and identify specific academic and career ideas and make progress towards these goals.

For some participants, especially Christy and Monica, the NCTFP provided a means to simplify complex decisions about postsecondary attendance and career choice. Christy had identified her own college preferences, but this pathway would require her to take out student loans. Christy had no particular interest in becoming a teacher but had applied to the NCTFP at her mother's recommendation. Once she was accepted, Christy's parents saw the NCTFP as a solution to college costs, which they had been increasingly concerned about. While premises of rational choice and cost-benefit analysis assume that people weigh all options and select the most optimal choice, Christy's own process suggests that this does not always occur. Postsecondary scholars note that this may be especially common for decisions related to higher education, where options vary on a substantial number of dimensions (Scott-Clayton, 2015).

Had Christy and her family weighed the full set of options, Christy may have applied to a computer science program at a public institution in North Carolina, thus meeting Christy's academic goals while keeping college costs down. As she did not, Christy's decision came down to two starkly different choices: an out-of-state institution to study computer science, and in-state institution to study technology education via participating in the NCTFP. In the end, Christy's parents made the decision based on their top priority: affordable college attendance. Given the constraints of the NCTFP, the program ultimately influenced Christy's institutional choice, academic major, and her post-graduate path.

The NCTFP also served as a means to simplify a complicated decision for Monica in choosing a career path. While Monica had long considered teaching as a career option, she also considered many other ideas:

When I was a senior, I was talking to my counselor about what careers I was considering...teaching was number two on the list or something. I couldn't even tell you what number one was now, but it wasn't teaching...My counselor was like, "Well, if you're interested in teaching, even though it's two or three on the list, you should look into this Teaching Fellows program.... I was like, "Okay." So, I went on [the website] and I was reading about it. I remember being like, "Oh my gosh, science or special ed? I'll take both, all the above. I will do every single thing on this list."

For Monica, the NCTFP helped to simplify the complicated decision of choosing a college major and career plan, especially since the program was being offered at her top choice institution.

For other participants, especially those further along in their postsecondary education, the NCTFP helped provide a "concrete" idea for the future, especially regarding the decision of where to teach and whether to stay in North Carolina after graduating. Several participants expressed an interest in leaving the state but were still deciding what their plans would be

immediately after graduation. For Kristen, the only participant who attended high school out of state, participating in the NCTFP helped to give a more specific direction, compelling her to stay in North Carolina, even though her ultimate goal is to eventually return home to teach:

[The NCTFP] gave me something to do after college, because I wasn't really sure my exact plan. I have a vague idea currently, but I don't really know. But it gave me something concrete for after college, "Alright, I know that I have to do this" ... I was like, "Well, I need to get experience anyway, probably going to do that in North Carolina because I'm going to be licensed here, why not get some money for it also?"

For some participants, the NCTFP offered a way to simplify otherwise complex decisions. The opportunity offered by the NCTFP constrained decisions in ways that helped participants set narrowed goals and make progress toward them.

Framing effects. As evident in themes above related to non-financial benefits associated with the NCTFP, one perceived advantage of the program is its reputation, even though this version of the program is new. The NCTFP operated in a different form from 1987-2011 but is in its inaugural year in its current format. While the general premise of the new NCTFP as a teacher recruitment program is consistent with the original version, the new program has a more restricted list of partner institutions, eligible subject areas and academic programs, a different set of postgraduate service requirements, different enrichment activities, and more. Yet, the NCTFP shares a name with its predecessor and this name recognition and reputation seemed to play an important role in some participants' decisions related to participation.

Reputation: "A recognizable name." Consistent with the theme above related to non-financial benefits associated with the NCTFP, interviews demonstrated that participants tended to see this program as an extension of its predecessor of the same name. Felicity recalls hearing one of her own teachers, a former Teaching Fellow, talk about the program:

I did have a teacher, I can't remember her name, but she was a Teaching Fellow. She went on some random rant about how awesome the Teaching Fellows program was as far as helping her to afford school...I thought it was a super cool program back then. My teacher was a really good advocate for it. She loved it, and she always made sure to tell us how awesome she thought it was, and how beneficial she felt from coming from the program.

Zoe had also known about the original program, which she learned about through research she had done while in middle school. As Christy's mother had been a Fellow herself, she, too, was familiar with the program.

Other participants were unfamiliar with the original program, but as the new NCTFP came up, teachers and family members shared what they knew about the original program. Even without knowing the structure of the financial benefits, Kyle had been interested in the NCTFP due in part to its reputation, which he learned about while reading about the program:

I did not know entirely what went into it, it was kind of like, "Oh, free money, I'll apply for it, why not?" I didn't know too much about the goings on. I did know that it was a nationally-recognized program and that it was just restarting.

Matilda also based her plan to apply at least in part on this reputation: "I knew that it was a big deal, because I knew there was a recognizable name and program, so I was like, 'Yeah, I'll apply.'" Soon after, Matilda learned that one of her favorite high school teachers had been a Teaching Fellow in the original NCTFP, further compelling her interest:

I was like, "Mom, I heard about this thing." She was like, "Yeah, [teacher] was a Teaching Fellow," and I was like, "Oh, she's a good person and a good teacher. Maybe I should apply, because she did it and she's awesome."

Monica also hadn't known about the program prior to learning about it from her guidance counselor but as soon as she considered applying, she started to hear more about it from family members and other people who were familiar with the original program.

I remember...my uncle knew someone who was a Teaching Fellow before they had taken a break from doing the program. He was like, "She can tell you anything you want about it." I ended up not meeting with her, but he was just telling me she said it was the best thing she did in college... And then anyone I met...they were like, "Oh, are you a Teaching Fellow?" It was mostly older people who had known about it...I would be like, "Yes," and then they immediately were like, "Oh my gosh, that's so amazing that you're a Teaching Fellow." It was crazy.

Jenna, too, encountered a similar reaction to her own admission to the program when one of her elementary school teachers recognized her name in a news report and reached out to the family:

When I got this scholarship and they sent it out, I guess all the old North Carolina Teaching Fellows could see that too. My second-grade teacher saw my name on it and he emailed my mom. He was like, "This is so cool. I'm a Teaching Fellow, class of '80" ...I thought that was really cool that he remembered who I was.

Victoria also heard good things about the program, mostly from her high school teachers who were familiar with the NCTFP and promoted it to her once they learned it was coming back:

When I first heard about Teaching Fellows, I heard about it from multiple teachers at my high school. They were like, "You need to apply for this. I will write your recommendations, I don't care, you need to apply for this." I was like, "Is this really that big of a deal?"

A critical reason why Victoria had applied was this encouragement from the teachers at her school. The framing of the NCTFP in the language of the older program's "nationally

recognized” reputation, even though the program is new, had an important impact on students’ perceptions of it, both for those who were familiar with the old program and those newly learning about it. Importantly, the positive reputation of the original program stuck, despite evidence of weaknesses associated with the original program. Instead, the experiences of the former Fellows that participants encountered were overwhelmingly positive, perhaps not fully representing the original program’s shortcomings, including the fact that many former participants did not receive the full financial benefits (e.g., Cohen, 2015; Denning, 2008; Henry et al., 2012; Hinchcliffe, 2019a).

Time-inconsistent preferences. Perhaps the most challenging part of making rational choices related to participating in the NCTFP is the difficulty in predicting the preferences of one’s future self. Behavioral economics demonstrates that preferences are not stable over time and that people tend to hold a bias towards the present, prioritizing present needs over future needs.

Present bias: “My story isn’t going to be the same.” Evident across narratives is that the NCTFP provided a solution to a highly salient proximal issue for all 10 participants: college costs. As presented in the theme related to financial benefit above, participants consistently listed the funding as their primary reason for applying to and participating in the NCTFP, even if it meant sacrificing subject area preferences (Zoe and Victoria), career preferences (Christy and Kyle), and post-graduate location preferences (Matilda, Victoria, Christy, Kristen). For all participants, committing to post-graduate service through the NCTFP helped to address immediate needs (an extra source of college funding to reduce college costs and providing), while the major costs of the program remain distal. Although these distal commitments may seem achievable now, time-inconsistent preferences suggest that they seem less so in the future as participants’ lives and preferences change.

One example of present bias is the inability of participants to predict their future financial needs. As described in the social persuasion theme, participants who were advised by respected mentors not to enter teaching tended to use distancing strategies to discern the financial needs and situations of those who gave this advice from their own. Monica says she grew up in an environment where money was tight and, as a result, she doesn't anticipate needing to make much money in the future: "I guess [money] is just something I look at as something I don't need." Monica and Zoe attributed these dissuading comments to the teachers' own financial responsibilities within their families:

It also had to do with their family situation...If they were single and had kids, those were most of the people that were like, "Don't be a teacher. You don't make enough money," because they were supporting other people on a teacher salary. It was [never anyone] who was single, no kids and teaching, or people with dual incomes and teaching...My aunt is a single parent, has three kids. When she was telling me not to become a teacher, it was not because she doesn't love being a teacher. I know she loves being a teacher. I just knew for her family she was not making enough to support her kids and what they needed for all three of them, especially because they're all really close in age. I knew that it was because they are supporting other people, not just themselves. (Monica)

Zoe also made this attribution:

I got a lot of the "Don't teach" when I was in high school... my senior year English teacher, she was like, "You could do so much more, don't teach because once you teach, you're trapped.... I got married, I had kids, it's just too hard to change jobs at this point." I was like, "Well, I feel like my story isn't going to be the same" ... The pay thing was really bothering them but that's not something that gets to me. I'm like, "It's just me, if I had kids or if I had a husband, I'd be more worried about it, but it's just me."

Also evident within these comments and others is the concept of overconfidence, or the tendency to overestimate one's ability while underestimating the abilities of others. While Zoe and Monica feel confident that they will not fall into the same pathways as their teacher mentors who struggled to make ends meet on a teacher's salary, especially because they are supporting dependents, the future is impossible to predict and participants' responsibilities and needs are likely to change over time.

Overconfidence was especially evident within the initial interest surveys used to recruit participants for this study. In these surveys, nine of 10 participants indicated that they were "very certain" that they would fulfill service requirements for the NCTFP. Yet, data on the previous version of the NCTFP show that at least 30% of participants in the former program paid back their loans in cash (Cohen, 2015; NCOSA, 2003). Data on the TEACH Grant, which has similar subject area restrictions as the NCTFP (although the programs have other critical differences), are far more dismal (Barkowski et al., 2018; CFPB, 2017; GAO, 2015). Part of this overconfidence is likely due to students' inability to predict life changes and the resulting needs and preferences of their future selves. Further, while the commitment to future service may not seem to be a substantial undertaking in the present, principles of time-inconsistent preferences show that it will likely become more burdensome as the future nears.

Participants' "very certain" responses about program completion alongside other bounded rationality themes and a natural uncertainty of the future suggest a likely discrepancy between participants' expectations about meeting all program requirements and their actual likelihood of doing so. Kyle indicated that he was "very certain" he would complete all program requirements on the interest survey for this study but, in interviews, suggested he is considering not teaching at all. Other participants may find themselves with opportunities and situations they had not anticipated, resulting in new and unexpected pathways. This seems especially likely

given the relatively higher attrition rates of new teachers (Gray & Taie, 2015; Sutchter et al., 2016), and participants' relatively limited teacher training and experience to date that can help confirm and define interests within the full scope of the career. At the time of this study, only one participant had started student teaching. For incoming first-year undergraduate students who enter the NCTFP and who do not choose to teach in low-performing environments, NCTFP-related commitments may extend up to twelve years, to 2030, assuming a four-year bachelor's degree completion timeline and no periods of loan deferment. These commitments are substantial.

Despite the length of NCTFP commitments, especially for first-year students, no participant expressed concern about the required length of service and their ability to teach for these periods. Several compared the expected service requirements to the length of other schooling experiences to justify the perspective that "four years is not that long" (Matilda).

Kristen elaborates:

Four years sounds fun. Four years is a good amount of time. At that point I'll be 26-ish, I can then decide if I want to stay, want to go abroad, want to do the Peace Corps, want to go to grad school, want to go home... It's essentially just another four years of college, and then I can go to real life. It's a good amount of time I feel like. There's a reason high school is four years and college is four years. I should make this four years.

Kristen plans to teach in North Carolina for four years regardless of whether she enters a low-performing school (if so, her service requirement would only be two years).

As a first-year student, Christy will have a four-year commitment if she enters a position in a low-performing school to pay back her NCTFP loans, eight years if not. Still, Christy is also undeterred by this commitment despite its lack of alignment with her primary goal to move out of state as soon as she is able:

School goes by so fast. A year goes by ... I just got here. I feel like I just moved in yesterday, and now we're already halfway through spring semester. It goes by really fast. I'll be helping, and teaching, and learning, and doing all sorts of stuff. It's fine.

The only participant who did not say that she was "very certain" that she would complete the NCTFP post-graduate service requirements on the initial interest survey is Matilda. Instead, Matilda said that she was "fairly certain" she would complete requirements. At the same time, Matilda's narrative makes it seem that she is among the participants most likely to complete these requirements. A college junior, Matilda will only receive two years of funding, thus owing only two to four years of service. Further, Matilda had already chosen to study chemistry education before learning about the NCTFP. Finally, Matilda may have had the strongest understanding of the NCTFP service requirements given her review of the requirements with her father, a lawyer. Matilda explains that she indicated "fairly certain" due to the possibility of unexpected events: "I don't know, things happen. I might get run out of the school by children throwing tables at me. I don't know, it happens. I don't think that will happen, but I don't know."

Matilda was also the only participant who acknowledged the problem of teacher attrition, especially in low-performing schools:

I know that another big problem facing low-performing schools is the idea of revolving door teachers. They don't have teacher retention... I want to go do it and try it and help the kids, but I'm afraid that I won't do well. I'll leave. I'll be part of the problem, or even worse, I'll do my two years, get my money back and then just disappear.

Alongside the earlier theme of lack of information and experience related to low-performance school environments, other participants tended to minimize these challenges and/or express high levels of confidence in their ability to navigate the realities of these situations. As

an example, Victoria talks about her perceptions of low-performing school environments based on recent school visits:

Going into [low-performing] schools I was like, “This is really different.” I realized the teachers have to think out of the box a little bit more in order to educate their students fully. I grew up in a school where every student was given a MacBook. These low-performing schools, they have textbooks. I’m like, “That’s super different than what I’m used to.” I was like, “That can be a really fun challenge.” I’m definitely one that’s like, “Let’s do adventurous things. Let’s do things that we’re not comfortable with. Let’s step out of our comfort zone and do something different.” Which I think is what really started appealing to me about the idea of going to a low-performing school. The fact that I’d have that challenge. There’d be something other than it just being really easy all the time...I think it appealed to me because it was going to be a challenge.

While Victoria acknowledges that teachers in these environments may be limited in their access to resources which can create challenges for their work, this is framed positively, as “a fun challenge” and “adventurous” rather than acknowledging the ways in which these limitations could be detrimental to the school experience, for students and teachers alike. A first-year student, Victoria’s plans are currently “to teach at a low-performing school and pay [NCTFP loans] back quicker.”

Kyle also plans to teach in a low-performing school. Because he himself grew up in challenging environments and schools with “a good amount of crime going on,” Kyle feels confident about his ability to work in this type of environment. When asked about the challenges in working in a low-performing school, Kyle says: “Probably just disruptive kids. I think that would probably be the biggest thing, just learning how to manage disruptions, basically. That’s the only one that I can really think of where it’d be a huge problem.” In general, participants

express limited insight into the types of challenges that teachers encounter on the job. As the principle of time-inconsistent preferences suggests, it is difficult for individuals to anticipate the future. Humans are prone to valuing our present needs and preferences highly when making decisions, a phenomenon that could have important implications for participants' abilities to meet their service commitments once that time comes.

Summary

Participants in the present study developed an interest in teaching careers through a variety of means, with eight of the 10 participants developing an interest in teaching from an early age, long before the introduction of the NCTFP. For these participants, an early interest in teaching was often inspired by positive experiences in school, including strong academic performance and success in roles similar to teaching, especially tutoring, all of which built participants' self-efficacy related to the career. Participants sought these roles out for themselves and were also frequently provided formal and informal helping roles by their teachers and other role models. Participants' experiences in helping others was consistently positive, creating an affirming affective state associated with teaching and helping work.

Participants frequently developed career goals to teach subjects that they had been successful in themselves, with participants' teaching plans mirroring both subject areas and grade levels where they had not only performed well but also had good teachers to support their success. While good teachers and family members in teaching served as positive role models for these careers, negative experiences with teachers also motivated some participants to enter teaching in order to do better. Not only did these social models influence participants' ideas about teaching, but they also provided advice about the career, too. All participants in this study were told that they had the skills to teach and, for some participants, this feedback served as a critical turning point, solidifying participants' plans to pursue teaching careers. However,

participants also commonly encountered advice not to enter teaching, advice that most often came from their own teachers and family members. Such advice typically cited low teacher pay, especially for students considering teaching positions in North Carolina, although one participant was also warned not to enter teaching due to problems with school administration. Participants tended to use distancing strategies to navigate this dissuading advice, instead remaining optimistic that a teaching career would be the best fit for their interests, especially relying on their own positive performance, social feedback, and affective experiences in teaching-related roles, all of which contributed to participants' developing self-efficacy for the profession.

In considering whether to apply to and participate in the NCTFP, participants tended to see the opportunity costs of applying as negligible. Predominantly, participants were attracted to the NCTFP due to its financial benefits, which offered substantial present-day assistance in reducing students' college costs. All 10 participants were interested in the program due to this funding, even in cases where money wasn't necessarily needed by student or the family. For some students, the NCTFP funding helped to actualize existing goals, enabling students to attend and/or justify attending the institutions they were already interested and to pursue preexisting career interests. For others, the NCTFP funding served as a sufficiently compelling benefit to motivate incurring proximal costs, such as compromising an ideal college choice, major choice, and/or career choice in order to pursue a pathway that still met broader goals (e.g., attending a four-year institution, becoming a teacher even if not in the desired subject area, etc.). Although the financial benefits were the strongest motivator for participants in joining the NCTFP, participants identified secondary benefits as well, including the program likely helping their future employment prospects, opportunities for professional development, and joining a community of educators with shared interests.

While participants weighed program costs and benefits in their decisions to participate, narratives also demonstrate evidence of bounded rationality. First, some participants committed to the NCTFP without complete information about the program and its associated requirements, and/or with a lack of understanding of certain program components. Even now that participants are all active in the program, some uncertainties remain, especially related to the timeframe in which participants must begin their teacher service and the meaning of working in low-performing schools. Participant stories also revealed participation in the NCTFP as a simplification strategy for navigating the highly complex decisions that participants were, and are, faced with related to postsecondary attendance and career preparation and choice.

Framing effects were also evident in participant decision making. The original NCTFP has an overwhelmingly positive reputation across the state (and also conveyed in program marketing), which persuaded and contextualized the participation decisions of several study participants. However, there are critical differences between the former and current NCTFPs and relying on the original program's past success presents a biased and otherwise inaccurate version of the new program, especially when the original program's shortcomings are not acknowledged.

Lastly, time-inconsistent preferences with a bias towards present needs were evident across narratives and decisions. Participants tended to display a high degree of confidence in their likelihood of completing program requirements and in their success across school environments, despite a host of evidence suggesting that these transitions can be difficult for new teachers, and that many participants in similarly-structured loan forgiveness programs, including the former NCTFP, do not complete all program requirements to actualize full benefits. Participants further downplayed advice that they received not to enter teaching, predicting that their future financial needs will be different than those of the people giving the advice. Especially for participants who will receive funding for four years, the long-term commitments

of the NCTFP are substantial and it is difficult for students to accurately predict the preferences and needs of their future selves.

CHAPTER 6

DISCUSSION AND IMPLICATIONS

The teacher workforce is experiencing a talent shortage, both in North Carolina and across the U.S., with the trend expected to grow (Bastian & Watts, 2016, Bastian & Xing, 2016; Carver-Thomas & Darling-Hammond, 2017b; Cross, 2016; NCES, 2012, 2017; Sutcher et al., 2016). Shortages have been attributed to challenges with both teacher recruitment and retention and are particularly evident in lower-resourced schools and in certain subjects, including STEM and special education (Aragon, 2016; BEST NC, 2018; Clotfelter et al., 2011; Ingersoll & Perda, 2010; Marder et al., 2017; NSB, 2015, 2016). To address shortages, governments have implemented a variety of economic incentive strategies, programs that provide teachers financial rewards for entering teaching, for entering certain teaching jobs, and/or for staying in these jobs (Kolbe & Strunk 2012). One new economic incentive program for teachers in North Carolina is the state's North Carolina Teaching Fellows Program (NCTFP), an updated version of a former and much-lauded teacher recruitment program in the state (Carver-Thomas & Darling-Hammond, 2017a, 2017b; Clewell & Forcier, 2001; Hirsch, et al., 2001; Kelly & Northrop, 2015; Podolsky & Kini, 2016).

The original NCTFP was launched in 1987, growing in size and scope until it was defunded in 2011 (Cohen, 2015). After years of the program's absence, 2017 brought the reintroduction of the policy in a new form under a new governing body. Like its predecessor, the new NCTFP partners with public and private North Carolina institutions to offer selected students admitted to teacher preparation programs upfront funding in the form of forgivable loans. Loan funding must be repaid in post-graduate qualifying teacher service in public schools within the state, or in cash with interest. The reintroduced NCTFP, however, is much smaller than its predecessor, restricting eligibility to students who plan to enter teaching careers in

STEM education or in special education, and partnering with only five campuses (UNC System, 2017), although the program may see expansion in the future (Fofaria, 2019; Hinchcliffe, 2019b). Also unlike the old NCTFP, undergraduate students of all class years and bachelor's degree holders are eligible for the current program, although students already enrolled in education programs are restricted from applying. The structure and length of the new program's loan forgiveness requirements are also different and are determined based on the years of funding that Fellows receive and the types of schools where Fellows teach. Repayment terms double in length from the original program unless a Fellow chooses to teach at a low-performing school. Participants who receive four years of NCTFP funding owe four years of teacher service in low-performing public schools in North Carolina, or eight years of teaching in public schools without this designation. A student who receives two years of funding (e.g., a college junior or a student entering a two-year master's program) owes the state two years of service in a school designated low-performing, or four years of service in a school without this designation. Fellows who do not complete their academic programs or who do not enter eligible teacher positions must repay all loan money received with an 8% interest rate over a maximum period of 10 years. The new NCTFP began its first year of operation this academic year, 2018-2019. For a quick comparison of the original and new versions of the NCTFP, see Table 1.1.

Within this context, this narrative case study explored the career-related development and decisions of 10 participants in the North Carolina Teaching Fellows Program. Due to the potential differential motivations for choosing to teach STEM or special education (Mamlin & Diliberto, 2015; Marder et al., 2017), and due to different economic opportunities associated with STEM fields and skills (Carnevale et al., 2015; Fayer et al., 2017; Langdon et al., 2011; LiVecchi, 2017; NCDPI, 2011), this study focused only on NCTFP participants preparing for careers in secondary STEM education. The purpose of this study was to understand how

participants developed career interests in becoming secondary STEM teachers, decision-making processes related to NCTFP participation, and the role of the program on participants' college and career decisions and future plans. Narrative inquiry and case study methodologies were combined in the present study. While the NCTFP policy served as the case, establishing bounds and providing context for participants' experiences, data analysis and presentation were conducted in narrative inquiry tradition (Riessman, 2008), using life course to acknowledge development over time and to situate narratives in sociohistoric contexts (Elder et al., 2003). Data were first analyzed by unit, using narrative thematic analysis (Chapter 4; Riessman, 2008), followed by category-centered analysis between narratives (Chapter 5) using the study's theoretical frameworks of social cognitive career theory and concepts drawn from behavioral economics. Findings point to the key experiences that shaped participants' interests in teaching, in teaching STEM subjects, and provide insight into participants' decisions to participate in the NCTFP and their future academic and career plans.

Discussion of Major Findings

The NCTFP has widely-defined objectives that include the recruitment and retention of teachers in STEM and special education subjects, with a secondary purpose of "creat[ing] a robust pipeline for providing highly qualified teachers for low-performing schools" (JLEOC, 2018, p. 22). Because this is the first year of the new NCTFP's implementation, data from the present study focus on participants' past and present career development (thus, participants' recruitment into teaching-related academic programs) rather than actualized job behavior and teacher retention, as these outcomes lay ahead for students. However, participants' respective plans for the future also provide important insight into Fellows' understanding of the NCTFP and the role of the policy in shaping academic and career goals and preferences among postsecondary student participants.

Recruiting students into teaching. When considering the development of teaching interests, findings reveal that most participants identified interests in teaching careers long before the current NCTFP was introduced. This is consistent with existing work that students may develop early interests in teaching (Mamlin & Diliberto, 2015), especially considering their exposure to K-12 teachers through their own educations (Lent et al., 1994, 2000, 2002; Nias, 1987; Sampson et al., 2004). However, the NCTFP is designed primarily as a teacher recruitment tool, aimed to recruit students who would not otherwise enter teaching (S. Ulm, personal communication, January 29, 2019), which is perhaps best illustrated by eligibility restrictions that prohibit students already enrolled in educator preparation programs from applying (NCTFP, n.d.). Findings suggest a disconnect between student participants' actual career decision making and this policy design.

One significant barrier for recruiting students into teaching is the pervasively negative perception of the career. Findings related to social persuasion revealed that participants were actively dissuaded from pursuing the profession, often from teachers themselves. The reasoning behind this dissuasion was almost universally economic and based on the idea that teachers do not make enough money, especially in North Carolina. In the present study, participants grappled with this feedback to varying extents; while some participants dismissed it outright, others reported feeling confused or conflicted in weighing their interests in the profession and this advice from respected social models. Even some participants who were most committed to the profession from the earliest ages felt conflicted about their career preferences based on this advice, demonstrating the weight that social persuasion can have on decision making. As the present study only features students enrolled in teacher preparation programs through the NCTFP, all participants ultimately decided to prepare for teaching careers regardless of this

advice. It is likely, however, that some students may internalize this type of dissuasion and opt to pursue non-teaching pathways as a result.

The NCTFP serves as one way to promote teaching careers among talented students, providing financial incentives that may help address fiscal concerns, at least those related to postsecondary costs incurred to receive teaching credentials. However, although the NCTFP is designed as a recruitment tool for teaching, data from this study demonstrate that students are most likely to be attracted to the program when their goals already align with those of the policy. In the present study, most participants were already planning to become teachers, and most participants were already planning to become STEM teachers before the NCTFP was introduced. For these students, the upfront costs of participating in the NCTFP were lowest; few sacrifices, if any, were required for these students to participate in a program that helped fund their existing academic and career goals. By contrast, when upfront costs in the form of altering academic or career goals to fit the program were required, the program was less compelling. The accounts of campus program faculty and staff leaders mirrored this account; coordinators vocalized difficulty recruiting students for the NCTFP unless students had pre-existing interests in teaching STEM or special education.

These findings align with research on recruitment outcomes for other similarly-structured programs that provide upfront loans and that require teaching service for loan forgiveness. While economic incentive programs such as the TEACH Grant and the Robert Noyce Teacher Scholarship Program have not been found influence students' likelihood of pursuing careers in teaching (Kramer & Peyton, 2017; Liou & Lawrenz, 2010), they have been found effective in influencing the types of teaching positions participants pursued, with more education graduates entered teaching positions in high-needs subjects and at low-performing schools as a result of the TEACH Grant policy (Barkowski et al., 2018; Kramer & Peyton, 2017) and more education

graduates entering teaching roles in high-needs schools as a result of the Robert Noyce Teacher Scholarship Program (Liou & Lawrenz, 2010). Based on these results, Kramer and Peyton (2017) conclude that economic incentives such as the TEACH Grant “are a potentially ineffective mechanism to induce non-education majors to pursue education” (p. 31).

Despite the overall prevalence of economic incentives used in teacher recruitment, most of the research on these policies focuses on the recruitment of already-trained teachers into certain types of positions, especially towards high-needs subjects and schools (AFT, n.d.; Clewell & Forcier, 2001; Kolbe & Strunk, 2012). Incentives such as higher salaries and bonuses are directly associated with teacher recruitment, although this influence is often mitigated by individual and school characteristics (Brill & McCartney, 2008; Clotfelter et al., 2011; Cowan & Goldhaber, 2018; Feng, 2009; Feng & Sass, 2018; Guarino et al., 2006; Hendricks, 2014, 2015; Imazeki, 2005; Kelly & Northrup, 2015; Leigh, 2012; Rickman et al., 2017). Overall, the lowest performing schools tend to have the most difficulty recruiting and retaining teachers and while offering economic incentives may help, these schools typically have limited resources and increases would need to be substantial in order to be effective (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009, Feng & Sass, 2018).

Overall, there is limited evidence for loan forgiveness programs recruiting students into teaching careers. Research that examines teachers’ motivation for entering the career largely reveals intrinsic and altruistic interests and goals, including the desire to contribute to and serve society, share knowledge, and work with children (Guarino et al., 2006; Jordan, 2017; Mamlin & Diliberto, 2015; Marder et al., 2017; Thomson et al., 2012). While extrinsic factors may motivate career interests in teaching, especially job security, schedules, and compensation (Day, 2006; Fike, 2016; Jordan, 2017), these factors are often weighed alongside intrinsic interests in the career. Students generally pursue careers that align with their values, interests, and talents and

these factors, along with personality and occupational fit, often playing a stronger role in major and career decision-making than financial factors and job characteristics (Brown, 2004; Carduner et al., 2011; Diekman & Benson-Greenwald, 2018; Krumboltz et al., 1976; Lent et al., 1994, 2000, 2002; Ma, 2009; Porter & Umbach, 2006; Sampson et al., 2004).

Consistent with existing research, participants in the present study largely developed an interest in the profession based on intrinsic factors fostered through interest and positive experiences in helping roles. Extrinsic factors, especially teacher pay, primarily served as a *deterrent* for pursuing the profession among participants. Low teacher pay, for example, was the most common reason that participants received advice not to enter teaching, feedback that often came from participants' own teachers. Teacher pay was especially cited as a deterrent for pursuing teaching careers within North Carolina, where teacher pay is lower than other states (NEA, 2018). As life course acknowledges the influence of historical times and place on one's experiences (Elder et al., 2013), these conversations may be especially salient due to the current sociopolitical climate of teacher pay and public education funding within North Carolina (Hui et al., 2019; Webster, 2018). Indeed, several participants mentioned economic conditions, political attention to the teacher workforce, and the larger Red for Ed movement in their narratives.

The program Teach for America (TFA) offers interesting insight into possible implications for students' varying motivations for entering teaching positions. TFA, like the NCTFP, aims to increase the prestige of teaching careers by recruiting high-achieving students into teaching for finite periods (Decker et al., 2004). Research suggests that TFA members least committed to teaching left the profession immediately after their required service to pursue other personal and professional goals (Donaldson, & Johnson, 2011; Heineke et al., 2014). Other participants stayed a year beyond their required service, demonstrating a commitment to education but not necessarily to pursuing teaching long-term. Participants in this category often

went on to non-teaching positions in education, similar to the way in which many Fellows in the original NCTFP became principals or entered other positions of educational leadership (Cohen, 2015; Hinchcliffe, 2019a). Unsurprisingly, TFA members who stayed long-term were those who were most committed to teaching, although teachers were generally also more likely to stay if they had positive experiences in the field (Heineke et al., 2014), which is, again, similar to research on Fellows in the original NCTFP (Denning, 2008). This research suggests that a person's motivations for entering programs like TFA, or possibly like the NCTFP, could have important implications for their longevity in teaching careers, although experiences on the job may influence these outcomes as well.

Christy and Kyle. While most participants in the present study applied for the NCTFP because they had already planned to become teachers, this was not the case for two participants: Christy and Kyle. Unlike the other participants, neither Christy nor Kyle had ever seriously considered teaching prior to their enrollment in the NCTFP. Both participants have unique stories and reasons for participating in the NCTFP, examples that serve to inform how the NCTFP could recruit students into teaching careers and potential consequences for doing so.

For Christy, a first-year student, participation in the NCTFP was not necessarily her choice, but that of her parents. In spite of her original plans to go to college out of state and study computer science, Christy's parents pushed her to participate in the NCTFP in order to complete college without taking on student loans. Christy plans to complete NCTFP teaching service after she graduates but she hopes to move out of state after fulfilling this commitment. While she would consider teaching long-term, Christy is also considering pursuing a career in technology, as per her original plans, and has family members with a business in this field. For Kyle, a junior, although NCTFP participation was his choice, the decision was the result of limited information. Kyle applied to and joined the NCTFP to reduce his college costs without realizing he was also

committing to post-graduate teaching service. Despite having already declared an education major prior to learning about the NCTFP, Kyle did not plan to teach until after learned about these stipulations. Kyle does not plan to stay in teaching long-term and would consider not teaching at all if a financially viable and appealing alternative arose at the time he graduates.

Although Christy's and Kyle's stories suggest that the NCTFP incentives have the potential to recruit students into teaching careers, especially students and families who are highly conscious of college costs, neither students' stories are ideal from a retention perspective; neither plans to stay as a teacher in North Carolina beyond their NCTFP service. While all other participants plan to stay in teaching at this point, Christy and Kyle are the only participants who see themselves likely to leave teaching careers once they pay off their NCTFP loans, if they complete the service at all. Both students, too, are motivated to consider low-performing schools for the option of completing their service more quickly in order to access other career goals. For both students, the interest in teaching is based predominantly on extrinsic factors related to the forgivable loan funding offered by the NCTFP, which helps to explain both participants' relative ambivalence towards the career. Although other participants were also motivated by the NCTFP's financial support in their decision to participate in the program, other participants weighed this extrinsic benefit alongside existing intrinsic motivations for becoming teachers.

Existing research and the experiences of Christy and Kyle call into question whether economic incentives such as loan forgiveness can realistically recruit students who wouldn't otherwise pursue teaching careers into the profession. Even if they are successfully recruited into teaching, will they stay? Will they be effective teachers? While there is a need to recruit more students into education to meet workforce demands and to continue to build a pipeline of qualified teachers, more compelling incentives may be needed to change behaviors not only

short-term, but long-term as well. If recruited students do not stay in the profession beyond their required service, is the money spent on their recruitment worth the investment? Right now, findings from the present study rely on students' interests and plans instead of their actual career behaviors. It remains to be seen whether Christy, Kyle, and other participants enter eligible teaching positions after graduating and, if so, whether they stay in these jobs throughout their service requirements and beyond.

Notably, Christy and Kyle both speak highly of their experiences in their education programs and in the NCTFP to date. The NCTFP has enabled both students access to applied experiences in classroom and other enrichment activities they would have not otherwise received, and both students report feeling well-prepared for either a teaching career and/or for a career in technology. Due to the importance of learning experiences in developing self-efficacy, these opportunities may well foster intrinsic interest in the career, especially if participants perform well and receive positive feedback for their work in these roles. It is therefore possible that Christy, Kyle, and other students who participate in the NCTFP without existing interests in teaching could develop late interests in the career through these applied experiences and could change their plans to enter and stay in teaching long-term. While these outcomes remain to be seen, if participants develop intrinsic interests in the career through NCTFP enrichment activities and curricular requirements, the program may indeed function as an effective recruitment program. Alternatively, if these outcomes do not occur and if Fellows choose to enter teaching positions primarily to receive loan forgiveness without the intrinsic motivation to be successful educators, Fellows' years in teaching could be not only detrimental to their personal satisfaction and effectiveness in the classroom (Denning, 2008), but also for their students' experiences and educational quality as well.

Recruiting non-education students. Despite the policy restriction designed to prevent currently-enrolled education students from participating in the NCTFP, all participants who applied to the program as current undergraduate students were already affiliated with educator programs on their respective campuses. Whether this occurred as a result of poor NCTFP policy enforcement, an unclear definition of these stipulations, or a different issue entirely remains unclear. However, the varying academic program structures between campuses seem to account for some differences. Some campuses create a distinction between the “teacher preparation” portion of academic programs, deeming education students eligible for the NCTFP so long as they had not yet reached this benchmark. Further, because students on some campuses major in their respective subject areas (instead of education) and work towards teaching licensure separately, students in these programs would also technically qualify for the NCTFP. Additionally, restricting currently-enrolled education students from applying, but allowing incoming students already interested in education careers to apply creates somewhat of a false distinction between students who may only be a year apart in their educational trajectories.

The restriction of currently-enrolled education students from applying inspired some concern and confusion among participants and coordinators. Monica suggested that because undergraduate students in education majors were ineligible for the program, they could change their major to another subject just to become eligible for the NCTFP. This idea was hypothetical; there was no evidence for this practice among participants. However, one program director also brought up this possibility, expressing an uncertainty in whether to advise students to do this, especially if they believed the NCTFP’s funding would be a critical resource for the student, and especially because many students had not known about the NCTFP when they first entered their academic programs. Monica further mentioned that this restriction prevented her from promoting

the program to peers interested in education, including peers who were not already in STEM or special education but who may consider these subject areas if accepted to the NCTFP.

Behavioral economics, especially framing effects, provides insight into how the communication of the NCTFP can influence student interest and participation. As Monica suggests, many students may not hear about the program until they are already enrolled in teacher preparation programs. In their study of the TEACH Grant, Kramer and Peyton (2017) similarly suggested that students who do not study education may not know about the Grant, especially because departments outside of education would have little incentive to share information on the program and encourage their students to leave their fields to pursue majors in education. Indeed, Barkowski et al. (2018) found that most institutions disseminate information about the TEACH Grant through financial aid offices and institutional departments/schools of education, with non-education departments receiving and sharing information about the program to a far lesser extent. This information dissemination pattern may be true for the NCTFP as well.

In the present study, nine participants were either already involved in education programs or planning to study education when they learned about the NCTFP (Appendix M). The only participant not engaged with education programs already was Christy, who had a family connection to the NCTFP. Among the five participants already enrolled in postsecondary education at the time of learning about the NCTFP, four had learned about it from faculty and staff associated with their institutions' education programs. The fifth may have as well; Matilda learned about the program on Facebook and was unsure whether this posting came from her education school or another source. Education faculty, departments, and programs were the primary sources for information about the NCTFP among participants, with this source perhaps unlikely to reach students in other major areas. Even if the NCTFP can serve as an effective

motivation for students not already involved in education programs to consider teaching careers, these students need to know about the program in order to apply.

The NCTFP therefore encounters a marketing challenge in reaching its target audience, students not already involved in education. In order to build stronger partnerships with non-education schools and departments for help with promotion, NCTFP stakeholders might adopt framing principles to consider marketing strategies that emphasize the components most compelling for non-education departments. For instance, NCTFP stakeholders could emphasize the ability of teaching-interested students to add a major in education or pursue teacher licensure *in addition* to their current departmental and program affiliation, as several participants in the present study are doing. The NCTFP could also emphasize the opportunity for students to participate in the NCTFP as a path to teacher licensure after completing their bachelor's degree in another subject, as Felicity did. Non-education departments may be generally more inclined to share information about the NCTFP if it does not recruit their students away, but instead gives their teaching-interested students more options and, simultaneously, an opportunity to reduce college costs.

Recruiting students into STEM education. Not only does the NCTFP seek to recruit students into teaching, but also into specific teaching domains, STEM and special education. Although NCTFP participants may study STEM education or special education, this study focused specifically on students preparing for careers in STEM education. As cited above, while economic incentive programs have not been found effective in recruiting students into teaching careers, programs have been found effective in recruiting education students into specific incentivized teaching roles (Kramer & Peyton, 2017; Liou & Lawrenz, 2010). This study also finds evidence of the NCTFP's impact on compelling teaching-interested students into careers in STEM subject areas.

Eight participants in the present study, including Christy and Kyle, held existing interests in STEM subjects prior to the introduction of the NCTFP. For Christy and Kyle, majors in technology education allowed for continued pursuit of their original and primary academic plans, even if they are also being trained for teaching positions. For the other six participants already interested in STEM education, the NCTFP supported existing goals and academic plans. Participants who held interests in STEM subjects prior to the NCTFP largely developed these interests from positive experiences and competency in these subjects through their education. Participants regularly described success in STEM subjects from early ages, remembering specific achievements that helped to foster and affirm their skills and self-efficacy in STEM, experiences that often occurred in middle and high school. Participants also tended to choose STEM education because of the relatively higher job security and social status of STEM in comparison to other teaching subjects, especially arts education (Matilda and Taylor), and were also attracted to STEM based on the transferability of skills to other non-teaching careers to keep opportunities open (Christy and Kyle).

Overall, findings suggest the NCTFP to be more compelling in recruiting teaching-interested students into STEM subject areas than recruiting non-teaching-interested students into education. Three participants in the present study changed their academic programs to focus on STEM subjects as a result of the NCTFP, all of whom were incoming first-year students at the time they had applied. In general, the NCTFP seems more likely to influence the subject area interests of incoming first-year students as compared to students who enter the program as already-enrolled undergraduate students, perhaps a product of the higher costs of changing majors among more advanced students, with implications for completion timelines and progress.

For three first-year students, the NCTFP served as the primary impetus for choosing STEM education. Monica had been considering both science education and special education

and she ultimately chose science education only after enrolling in college and learning that her institution did not offer the program that she originally sought in special education. Pursuing STEM education became her only option to continue participating in the NCTFP although, fortunately, she also happened to hold an interest in science. First-year students Zoe and Victoria would have likely become teachers in subjects not incentivized by the NCTFP, but the program compelled both participants to specialize in STEM subjects. Although neither Zoe nor Victoria originally wanted to become STEM teachers, both had performed well in these subjects throughout their education and felt comfortable specializing in these areas, even if they weren't their first choice.

For both Zoe and Victoria, the NCTFP was critical to their ability to afford college. Both weighed the financial benefits of the program heavily, as their participation allowed both students to meet larger college-going goals; Zoe in attending her first-choice college, a private institution, Victoria in affording a four-year institution. Both students decided that the costs of changing majors and sacrificing preferred subject areas were worth the NCTFP's financial benefits. While Zoe didn't seem to have trouble making this decision, it weighed heavily on Victoria and she committed to the NCTFP only after talking to many people and conducting substantial research on her options, also receiving encouragement from multiple sources towards this plan. Again, when the extrinsic rewards of the NCTFP compelled decision-making, these decisions are costlier and less certain. Like Christy and Kyle being the least certain of their plans to stay in teaching, Zoe is the least certain of her plans to stay in STEM education and could see herself going back for certification in other subjects once she completes her NCTFP commitments. However, Victoria and Monica both envision staying in STEM education now that they feel more closely connected to these plans. Since all three participants are first-year

students, continued positive experiences that build self-efficacy and identity in STEM education may help participants to confirm and build commitments to these careers.

Retaining North Carolina education talent. While there is some evidence of the NCTFP recruiting participants into teaching careers and into STEM education, the costs of entering the program were perceived significant by most participants unless they already held goals that aligned with NCTFP terms. As this study only includes NCTFP participants, I can only infer that other prospective NCTFP participants felt unable to sacrifice other goals and opportunities to commit to the program, an experience voiced by several campus coordinators as they talked about challenges encountered in recruitment. While these compromises may have been seen as significant, staying in North Carolina after graduation was generally seen as a lower cost of participation, even if this commitment did not reflect participants' original plans. Study participants varied in their accounts of whether they would have stayed in the state regardless of the NCTFP, but the NCTFP confirmed these plans for all students who were otherwise still deciding. The requirement to teach in state seems to be an effective way to recruit talented students to stay in state, at least in the short-term.

With the exception of Kristen and Christy who had family connections out of state, participants most interested in leaving North Carolina cite low teacher pay and better teacher conditions in other states as fundamental reasons behind these plans. However, recent political changes could mean improved conditions for teachers in the state, perhaps compelling those who start their careers in North Carolina to stay longer. Teachers in North Carolina, like in many states across the country, have put pressure on state politicians to raise pay and support for public education, with recent state budget proposals calling for increases in teacher pay (Fofaria, 2019; Turner & Lombardo, 2018). For Matilda, the decision to stay in North Carolina long-term hinges on the availability of master's pay for teachers, a policy that the state had eliminated in 2013,

although there is bipartisan support for bringing back this incentive, at least in some form (Hui, 2019a; S.B. 28, 2019-2020 Session, NC 2019). With state legislation on these topics changing quickly, it may be especially difficult for participants to plan ahead and make fully informed decisions about future career plans. However, if the NCTFP serves to simplify students' career decisions to stay within state immediately after graduation, these additional sources of teacher support could help retain talent even longer.

Although participation in the NCTFP is currently restricted to those who are from North Carolina, already-enrolled students who are not from North Carolina may apply, as was the case for Kristen. Kristen specifically listed the NCTFP's requirements to teach in state as one benefit of the program; the provision of a concrete plan. The prospect of recruiting students from out of state into teaching positions in North Carolina public schools is one potential benefit of partnering with private institutions who may be more likely to enroll out-of-state talent. If the NCTFP is most concerned with broadening their pipeline of new prospective teachers, opening eligibility to students from out of state could help bring new talent to North Carolina institutions and public schools, especially if improving teacher conditions could compel these graduates to stay long-term.

Program name and reputation. Regardless of the alignment of the NCTFP and participants' existing interests and plans, the program holds a major advantage in its marketing and promotion to students, its name. Even though the NCTFP is in its inaugural year, it has the unique advantage of legacy based on the predecessor NCTFP, despite key differences between the two versions (see Table 1.1). The original NCTFP was popular across North Carolina and within teacher recruitment and retention literature, often cited as a model program (Carver-Thomas & Darling-Hammond, 2017a, 2017b; Clewell & Forcier, 2001; Hirsch et al., 2001; Kelly

& Northrop, 2015; Podolsky & Kini, 2016), and this legacy seemed well-promoted in the marketing of the current program, and in current participants' understanding of the opportunity.

While not all participants were aware of the original NCTFP, some were. Felicity and Zoe were both highly conscious of college costs early in their K-12 education paths and, as early as middle school, learned about the original NCTFP and identified the program as a possible means for funding their respective postsecondary educations. Both students recall being disappointed to see the original NCTFP go away and being excited to see that it was when they needed the financial support. Even for students who had not known about the original NCTFP, the emphasis on the earlier program's success in the new program's marketing was evident in decisions to participate. One of the primary non-financial benefits that students identified in choosing to participate in the NCTFP was the original program's reputation the resulting expectation that this affiliation would help with participants' network and eventual job search.

The association between the old and new versions of the NCTFP offers both pros and cons related to participants' understanding of the program. As an advantage, the new NCTFP has name recognition across the state. Monica received congratulatory responses from people she barely knew, while Jenna, too, was surprised to see her second-grade teacher reach out to congratulate her acceptance as well. Victoria was strongly encouraged to apply based on her teachers' knowledge of the program. Matilda and Felicity both had teachers who talked about their own experiences in Teaching Fellows. One goal of the original NCTFP was to counteract the "declining appeal of the teaching profession" (PSFNC, 1986, p. 6) in order to promote the teaching profession and recruit high-ability students into teaching. While it is difficult to measure this impact, the program certainly seemed to have earned a lasting reputation across the state.

However, promoting the new program on the basis of the original program has its shortcomings. Marketing about the original NCTFP is likely to highlight the program's successes

without acknowledging its deficiencies. Given the lack of attention to loan repayment outcomes in reports that describe the original NCTFP as a model program (Carver-Thomas & Darling-Hammond, 2017a, 2017b; Clewell & Forcier, 2001; Hirsch et al., 2001; Kelly & Northrop, 2015; Podolsky & Kini, 2016), or even in the program's evaluation (Henry et al., 2012), prospective and current NCTFP participants are unlikely to be aware of the fact that not all participants in the former program received full loan forgiveness; at least 30% did not (Cohen, 2015; NCOSA, 2003). As students are often faced with complicated decisions related to college, major, and career choice, cognitive burden may be especially likely, and prospective participants may be especially dependent on the structure and presentation of information, including program marketing (Scott-Clayton, 2015). As evidence, participants in the present study regularly lacked information about certain aspects of the NCTFP that were critical to their ability to make fully informed and rational decisions about participation, and about planning for the future. Even Kyle, who had done minimal research and who had not known about the loan forgiveness aspect of the NCTFP, knew that it was a "nationally recognized program" at the time he applied.

Future plans and time-inconsistent preferences. Consistent with existing research related to college student career development and decisions, each participant's experiences, plans, and future career goals were highly individualized. Although participants have NCTFP participation in common, their experiences in the program and the costs and benefits they assessed related to participation (both perceived and actual) varied widely. Some of the variation relates to the years of funding participants receive and the alignment of participants' original career goals with NCTFP stipulations. As the NCTFP is structured so that those who are furthest from program costs (incoming first-year students) receive the highest proximal benefits (four years of funding), the program may seem especially attractive to incoming first-year students. However, incoming first-year students not only receive the greatest (potential) financial benefits

of the program, but also incur the greatest future costs. If first-year students receive program funding for four years, they are eligible for up to \$33,000 in forgivable loans. First-year students' service commitments are also the largest, four years at minimum and eight years if they do not choose to teach in low-performing schools. For first-year students who complete all academic requirements without delay and who enter teaching positions in North Carolina public schools not categorized as low-performing, it will take 12 years to meet college and service requirements, with completion in 2030. Commitment length varies widely; Felicity, the only graduate student participant in this study, has only received one year of funding and has only two years of teacher service, a maximum total commitment of just three years to the program.

Given the principles of time-inconsistent preferences, perhaps it is unsurprising that this type of program would be attractive to participants, as program benefits (funding) are mostly proximal and address immediate needs (college expenses), while program costs (loan repayment) are predominantly distal. For first-year students making decisions about where to attend college, this program may be especially compelling, allowing decisions that students may not have been able to justify otherwise. However, it is easy for people to assume they will meet certain goals in the future but when that time actually comes, the burden of these tasks seems greater than it did at the time of the decision, representing inconsistent preferences over the course of time. While NCTFP participants currently envision their future selves eager to teach for four or more years within public schools in the state, their future selves may not hold this same interest or goal.

Due to the differential experiences and commitments of participants who enter the programs at varying points in their academic trajectories, time-inconsistent preferences may help to explain differences between student decisions. First-year students were likely to adjust their goals in some way in order to receive program funding, while more advanced students tended to only participate if the program already aligned with their existing plans. First-year students (and

Felicity) also accessed the program at a time when they were making college decisions, with their acceptance into the NCTFP generally weighing heavily into college choice, allowing Zoe, Taylor, Victoria, and Felicity to justify their institutional choices financially. For incoming first-year students, the NCTFP serves as a way to address a present problem (college costs), with the costs of participation the most distal, although the most significant. Notably, due to the likelihood of students changing majors and plans throughout college, especially at the beginning of their undergraduate experiences (Astorne-Figari & Speer, 2019), some institutions that offer the TEACH Grant limit participation to juniors, seniors, or graduate students based on similar trends, finding that first and second-year students tend to be less likely to retain the same career plans throughout the course of their full postsecondary education, and beyond (GAO, 2015).

Present-biased behaviors are evident in literature related to financial aid programs, particularly those that address student loans/loan subsidies. In general, research suggests that financial aid programs are more attractive to participants when they address proximal costs (Gandhi, 2008; Field, 2009), even if the benefits are fiscally equivalent to those that offer more delayed benefits, demonstrating the idea of framing effects alongside present bias. By providing money to students upfront instead of post-college, the NCTFP allows students to better rationalize and address present-day college expenses. However, the distal costs of the NCTFP could also create challenges for students' abilities to accurately predict their future goals, needs, and actual likelihood of meeting program requirements. Particularly when paired with literature that shows the highest attrition in the first years of one's teaching career, especially for teachers in low-performing schools, it is likely that participants overestimate their ability to complete future goals (Baum & Schwartz, 2015; Camerer, 2014). Of course, as this study only includes current students, participants' actual decisions in the teacher workforce remain to be seen. Despite lacking critical information about the NCTFP and the inherent uncertainty of the future,

participants still universally expressed high degrees of confidence in their ability to meet all program requirements.

This potential overconfidence was also evident in participants' responses to the advice many received not to enter the career. Participants commonly adopted distancing strategies to justify their decisions not to heed advice about not entering teaching, confident that their own story "isn't going to be the same" (Zoe). At the same time, it is nearly impossible to predict one's financial needs in the future due any number of unforeseen circumstances. Although participants may anticipate limited financial needs in the future, it is possible that these situations could change. In sum, the NCTFP, like many financial aid programs, relies on consistency of preferences across time, while behavioral economics suggest that this idea is simply unrealistic. Evidence of the teaching service completion rates in the original NCTFP and similar programs serve to illustrate this concept: preferences and situations change over time.

Low-performing school incentives and unintended consequences. Research on teacher shortages suggests that low-resourced and low-performing schools are those that tend to have the greatest difficulty attracting and retaining teachers, especially teachers in high-needs subjects like STEM (Aragon, 2016; BEST NC, 2018; Clotfelter et al., 2011; Ingersoll & Perda, 2010; Marder et al., 2017; NSB, 2015, 2016). These difficulties can be attributed to the more difficult teaching contexts in low-performing schools where there is often less funding to support teachers which can have important implications for job characteristics such as pay and benefits, the availability of administrative support, professional development, supplies, and more (Borman & Dowling, 2008; Feng, 2009; Horng, 2009; Guarino et al., 2006; Simon & Johnson, 2015; Staklis & Henke, 2013; Struyven & Vanthournout, 2014; Sutchter et al., 2016). Low-performing schools, then, often operate under strained budgets, unable to recruit and retain qualified and high-ability teachers, with implications for the students' educational quality, a cycle of systemic inequity.

Participants in the present study expressed a general lack of understanding of what it means to teach in a low-performing school. Perhaps relatedly, preferred school type was often the least developed part of Fellows' future career goals. Interview data commonly showed participants' limited understanding of the term "low-performing," whether acknowledged directly by participants who felt they did not have a clear understanding of this term or experiences in these environments, or as evidenced by participants' language and ideas about what teaching in a low-performing school environment may entail. When discussing this finding in second interviews, participants generally explained that "low-performing" is a term they researched and understood at the time of committing to the NTFP but that they no longer held a clear definition of, in part because their job decisions are largely distal at this point. "Low-performing" was also frequently conflated with "low-income," a term that participants seemed to encounter more often through their coursework and other education activities.

While some participants expressed an interest in teaching in schools where good teachers are needed most, some of the same participants described feeling ill-equipped to teach in low-performing environments. Commonly, participants were interested in learning more about schools that fit this designation in order to make informed decisions. Participants who felt most informed about their plans by school type had personal access to teachers who had worked in different environments and who could compare the experiences and advise the participant accordingly. Other participants who felt confident about these plans based their preferences for low-performing schools on their own experiences in environments with limited resources (Zoe and Kyle), although these participants also demonstrated a limited understanding of the formal definition of the term.

For most participants, the incentive to complete service more quickly was not a primary driver of career goals, at least not at this point in their academic careers. Instead, because most

participants had already planned to teach, and to teach STEM, the length of time in which they were committing to teaching positions did not hold a major influence on their preferences for school type. Instead, the incentive for completing service more quickly was most compelling to students who were eager to leave teaching, leave secondary STEM education, and/or to leave North Carolina to access other goals. An unintended consequence to this policy component, then, could be that it pushes students who are less intrinsically motivated to teach into positions and environments that may be the most challenging, especially for new teachers. Not only could this have an adverse impact on the teacher's likelihood of staying in the profession since these environments may be more difficult to be successful in (with negative consequences for self-efficacy in teaching) but, more importantly, it could have adverse implications for students in these schools. As access to high-quality teachers who stay in low-performing schools over a long period of time may already be limited, motivating new teachers who have limited drive to teach, to teach in low-performing schools, and/or to stay in these schools, could perpetuate the high turnover that these schools may already experience. At the very least, if the NCTFP seeks to effectively recruit students to teach in low-performing schools, Fellows must receive greater education about schools that fit this designation.

Implications for Policy

The present study focuses on a newly instated teacher recruitment policy in North Carolina, with potential to influence the policy's continued growth and evolution. The NCTFP is likely to undergo change in coming years, especially as state politicians suggest program expansion (Fofaria, 2019; JLEOC, 2018). Findings here may inform future directions for the NCTFP and for other teacher recruitment and loan forgiveness programs that share a similar mission and structure.

Increase teacher pay. One common experience that mitigated participants' interest in teaching careers is the advice that they received not to enter the profession. Within this study, teachers were often the primary source of this dissuasion. Consistently, teacher social models shared that they did not believe teaching to be a financially sustainable career. Even among participants who were interested in teaching careers from early ages, advice led to some hesitation about entering the career. While all participants in the present study have committed to academic programs in teaching and are likely to enter the field, it is also likely that this type of advice may deter other students from pursuing teaching. Compounded with teacher pay and conditions in the state, participants in the present study frequently navigated difficult advice not to teach, but especially not to teach in the state of North Carolina.

If the current role models in teaching—often teachers the participants looked up to most—are telling students not to enter teaching, it is no surprise that recruiting talent to the profession is proving difficult. Teachers are telling students they aren't making enough money. College graduates in education receive the lowest starting salaries and pay over the course of their careers (Carnevale et al., 2015). Given the stark opportunity costs for STEM-skilled students who enter teaching (LiVecchi, 2017), expected salary is often a primary deterrent for pursuing the career (Marder et al., 2017). To address the societal narrative that teachers do not make enough money in the U.S., and especially in North Carolina, teachers must be better compensated. Teachers who feel financially supported will likely become champions for the career instead of dissuading others from it. Teaching is one of few career pathways that children and adolescents interact with regularly through their own experiences, a prime opportunity for vicarious learning. If social models are happy, successful, and well-supported in their roles, students are likely to imagine their own success in these positions, too. Fortunately, North Carolina policy shows positive movement towards better supporting teachers financially, with

the state committed to raising teacher pay, although even with recent projected increases, the state will remain below the nation's average in teacher pay (Hui, 2019b). Notably, salary increases must be available not only to new teachers, but to incumbent teachers as well.

Address inequities in salary supplements. Research consistently shows that salary matters in teacher recruitment and retention (Brill & McCartney, 2008; Clotfelter et al., 2011; Feng, 2009; Feng & Sass, 2018; Gilpin & Kaganovich, 2012; Guarino et al., 2006; Hendricks, 2014, 2015; Imazeki, 2005; Leigh, 2012; Rickman et al. 2017). Further, findings from the present study suggest that some incumbent teachers are unhappy with their compensation, recommending for their students not to pursue the career as a result. While a universal increase in base pay for North Carolina teachers may help improve morale and the general perception of the career, responding to salary supplement inequities across school systems could address challenges that low-performing, low-income, and/or rural schools in North Carolina face in recruiting teachers.

To recruit students into teaching positions in the areas and schools where they are most needed, offering higher supplements can help offset salary differences between the greatest- and least-resourced schools in the state. Teachers in Charlotte-Mecklenburg and Wake County School Systems not only make the most money based on receiving the highest salary supplements, but they are also located in the most economically robust areas in the state, which may be more desirable destinations for many new teachers (NCACC, 2017; Tippet & Stanford, 2019). By contrast, schools that provide low salary supplements, or none at all, not only pay teachers less but are also located in more rural areas with more limited economic and social opportunities. Reducing inequities in salary supplements may help to address teacher shortages by region and better support and promote teaching opportunities in the schools that need qualified talent the most. As the state government prioritizes the need for recruiting talent to low-

performing schools as it does through the current format of the NCTFP, devoting resources to addressing salary supplement gaps by school systems may help further promote the recruitment and long-term retention of teachers to these schools, especially if coupled with other economic incentives such as loan forgiveness.

Clarify the NCTFP mission to recruit retainable teachers. Currently, the NCTFP seeks to “recruit, prepare and support students residing in or attending institutions of higher education located in North Carolina to become highly effective STEM or special education teachers in the North Carolina public school system” (NCSEAA, 2018, p. 4). The NCTFP is structured to provide economic incentives in the form of loan forgiveness to motivate students to pursue teacher education programs and to become teachers in high-needs areas in the state. Yet, the study’s theoretical frameworks and findings underscore the importance of self-efficacy in developing intrinsically-motivated career interests (Lent et al., 1994, 2002). Overall, “the stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them” (Bandura, 1994, p. 73). As a result, career decisions made based on extrinsic factors alone may foster a situation where students make decisions based on limited information and commitments to the profession (Heineke et al., 2014). Even if the NCTFP serves as an effective teacher recruitment tool, does it recruit students who would stay in these roles long-term? Findings from the present study suggest that participants most committed to entering and staying in secondary STEM education teaching positions are those who had pre-existing interests in the types of positions incentivized by the NCTFP prior to the program’s introduction.

If the NCTFP continues to situate itself as an effective recruitment tool for the teaching profession, especially among students who might not have otherwise considered teaching careers, it might consider strategies for building prospective teachers’ self-efficacy and interest

in the profession *prior* to students' commitment to the program. In its current form, the NCTFP works in the opposite way, providing extrinsic incentives upfront and building students' self-efficacy through enrichment activities after they have committed to post-graduate service. While this may be a successful strategy for some students—such outcomes remain to be seen—it also comes with problematic assumptions that can push students to make upfront commitments based on extremely limited experience and information about teaching careers. Even among those who do make decisions based on prior experiences and existing interests in teaching, preferences often change over time (Castleman et al., 2015). How, then, can the NCTFP help students make more informed decisions about teaching STEM education in the state's public schools *before* committing to the program?

Foster pre-college teaching interest. Most participants in the present study developed an interest in teaching prior to college, some at a very early age. The two participants who are newly considering teaching careers as a result of NCTFP are both doing so as a result of circumstances that were either unintentional or somewhat out of their control and neither is committed to staying in teaching long-term.

While some participants have planned to become teachers throughout their lives, many held this interest alongside considering other options. Career ideas were highly malleable in middle and high school years and most participants finalized their decisions towards teaching during these critical periods. Although the NCTFP seeks to operate as a teacher recruitment program, its incentives only reach students once in college, indicating somewhat of a temporal disconnect between the time that many students establish career preferences and the time in which the program hopes to freshly promote students into teaching careers. While this timing could be effective for students who are searching for new career paths after they have explored

and discounted other ideas (like Kyle and Felicity), reaching students during college misses key developmental and decision points for many students.

If the NCTFP wants to successfully recruit students into teaching careers while helping them to build self-efficacy and resulting interests in the career, the program may consider strategies for reaching students earlier than college. Students in the present study who were making decisions between teaching and other ideas were often in search of opportunities that would help them to discern between options. To try out various career interests, participants took CTE classes, conducted internships, tutored, worked at summer camps, and more. Providing and supporting these applied opportunities could help secondary students try out teaching careers, especially those who may be considering teaching alongside other options. By providing these types of applied activities, the NCTFP can help to build self-efficacy among prospective education majors, thus, fostering stronger interest in and commitments to the profession long-term, rather than relying on extrinsic sources of motivation.

Because the NCTFP has retained many aspects of the original program in the state, including its name, it already has an existing network of teachers who may be eager to engage. Zoe suggested that she would like to see a mentorship component added to the NCTFP where Fellows could be matched to current teachers, creating relationships across the program. Similarly, the NCTFP might consider ways to take advantage of its existing network to engage middle and high school students in teaching-related opportunities, supporting potential and budding interests in these careers. Former Fellows could help to promote teaching experiences for students in their schools through clubs, like Future Teachers of America, volunteer organizations, or through coordinating with programs that may closely align with NCTFP-targeted subject areas, such as K-12 STEM programs, or programs for youths with disabilities. By engaging secondary students in teaching-related experiences, the NCTFP can dually promote

its brand to prospective future Fellows while also fostering interest in teaching among a broad and diverse pool of students developing formative career preferences and deciding between multiple career options. Since teaching-related experiences were critical to many of the present participants in career decisions, similar activities could benefit other prospective education students as well.

Open eligibility to currently-enrolled education students. The NCTFP currently *excludes* already-enrolled education students from applying to the NCTFP, presumably because the program currently seeks to recruit students who wouldn't otherwise pursue teaching careers into the field. However, the experiences of participants in this study show this restriction to be ineffective. Not only does the restriction differentiate eligibility of students by campus based on variations in academic program designs and create false distinctions between students of different class years, it also restricts student candidates most committed to teaching from participating. Existing research shows that loan forgiveness policies hold limited effectiveness in recruiting students into education fields (Kramer & Peyton, 2017; Liou & Lawrenz, 2010). Where they are more successful, however, is in recruiting students and graduates into specific types of positions. By allowing education students to apply for the program, the NCTFP can open candidacy to students already highly committed to teaching careers, perhaps directing more students into targeted high-needs subject areas, as was the case for Zoe and Victoria. If the NCTFP truly wants to build capacity for retainable teachers in North Carolina in STEM and special education, expanding eligibility to already-enrolled education students is an optimal strategy for recruiting students who are already intrinsically driven toward the profession.

Availability and accessibility of information. One important challenge to effective policy take-up is clarity in policy language and requirements. Some of the most severe examples of bounded rationality in decisions in the present study come from a lack of information, and/or a

lack of understanding of program information. Overall, findings suggest great opportunity for improving the communication and information shared with prospective and current Fellows to support students' making informed and rational decisions.

Enhance information on program website. One strategy that the NCTFP should consider is using its website (<https://myapps.northcarolina.edu/ncteachingfellows/>) to convey important information to prospective and current participants about the program. Although the website currently provides basic program information, this platform serves as an ideal forum to additionally emphasize and clarify common points of confusion outlined in the findings section because it is universally available and cost-effective for the NCTFP.

Across interviews with both program coordinators and participants, it became evident that each of the partner institutions have significantly different structures, requirements, and availability of academic programs. Although program offerings may change in the future, not all campuses offered both STEM and special education programs in this inaugural year, critically affecting the trajectory of one participant. For example, while some institutions offer secondary programs in certain STEM subjects, they may not offer programs in other STEM subjects. Institutions also vary in their availability of undergraduate and graduate-level programs in different subjects, and in the structure of programs based on students' primary major (e.g., in education or in a STEM subject area, length of master's degree programs, and more). To promote participants' understanding of their academic options across campuses, especially for incoming students, the NCTFP should include information about each institution's academic offerings on their website, linking to up-to-date institution-specific resources to clarify academic program offerings by campus.

The website could also provide information about the cost of the program, including a calculator that helps prospective participants understand (a) how much funding they would be eligible for based on their academic status—a point of confusion for at least one participant—and (b) the associated costs of paying this amount funding back in service and/or in cash with interest. No participant in the present study mentioned the interest rates associated with the NCTFP loans, yet this is one of the costliest components of the program. To enhance the transparency of long-term program costs, a calculator may help participants to understand how much money they will owe if service terms are not met. There is precedence for using this type of tool on websites designed for prospective students and families; colleges are federally required to provide a net price calculator on their financial aid websites (NCES, 2018). Literature providing insight on effective practices related to website financial aid calculators (e.g., The Institute for College Access & Success, 2012) could inform the NCTFP's approach to instituting a similar tool. Providing personalized information targeted for the consumer's situation is one way that existing research has found information interventions to be particularly effective in promoting postsecondary participation and behaviors (Bettinger et al., 2012; Mulhern, 2019).

Use early contact points to communicate service requirements. For the most part, participants indicated a basic understanding of the post-graduate service requirements associated with the NCTFP. However, there was evidence of gaps of understanding and opportunity for better communication between program administrators and prospective and current NCTFP participants. The NCTFP has several direct touchpoints with candidates before invited participants officially enroll in the program, namely the online application and the interview process. Featuring information about the NCTFP service requirements in both of these contexts may help ensure that future participants fully understand program requirements and the nature of

their commitments. The online application may, for example, include checkboxes that participants must click in order to submit their application, confirming that they know that the program funding is provided through forgivable loans with attached teacher service, with links to additional information about these stipulations. Additionally, because the NCTFP conducts in-person interviews with all program candidates, interviews could be a second venue for clearly communicating stipulations and program requirements to further ensure that the information is received and understood by prospective participants.

Regular sharing of information regarding low-performing schools. The program component that students seemed to know least about the least about was the low-performing designation of certain schools and what it means to teach in these environments. Even if this designation does not matter to students' school preferences, NCTFP participants should have a stronger understanding of the schools that are considered low-performing based on the significant impact of school designation on the timeframe of their loan forgiveness. Kristen was the only participant who reported having a list of schools considered low-performing, a list that she obtained only after doing significant research. Although she saved the list for future reference, changing designations will mean that the resource will likely be outdated by the time she applies for jobs. The NCTFP should regularly send updated lists of low-performing schools to Fellows, an active reminder of this program goal that simultaneously provides Fellows ready access for looking up specific schools and otherwise planning for their careers post-graduation.

Part of this knowledge gap could be attributed to the status of the program in its first year; Fellows should continue to receive education on different school types through their education courses and curricula even independent of the NCTFP. Indeed, participants expected that they may gain a stronger understanding of different types of schools throughout their academic programs and/or through student teaching. However, by incentivizing students to enter

low-performing schools, the NCTFP would benefit by intentional programming that increases Fellows' understanding of these differences. The original program, which did not incentivize low-performing school entry, took Fellows on the DISCOVERY TRIP, a week-long tour that highlighted diverse economic conditions and industries throughout North Carolina (JLEOC, 2007). A similar enrichment program may benefit current Fellows, especially considering the new focus on low-performing schools and the lack of understanding that participants in this study displayed about low-performing school environments. Fellows must receive exposure to different school types to understand the unique challenges across K-12 education and to make informed career decisions accordingly.

More enrichment opportunities. Findings suggested that participants perceived the NCTFP as a source of money but didn't feel like they had a strong sense of the program beyond the financial support. Because their campuses were responsible for providing enrichment opportunities, participants tended to associate their professional development to their campus, instead of to the larger statewide program. While this was the case for students across partner institutions, it seemed especially true for the participants at the private institutions, all three of whom were also members of the respective private Teaching Fellows programs on their campus.

Nearly a full academic year into the NCTFP, participants have yet to participate in any program-wide activities, with the first statewide activity occurring in April 2019, after interviews for the present study. Although participants widely identified the financial support of the NCTFP as the program's primary benefit, an interest in being part of a larger community of shared professional interests was another perceived benefit. Yet, participants feel that they have had limited opportunity to access a larger community, as there has not yet been an opportunity for students, and for coordinators, across campuses to meet one another. To help promote the identity of the NCTFP as a cohesive program and to help students begin to create networks with

other students with similar goals, the NCTFP would benefit from holding a program-wide activity in the beginning of each academic year and may consider other ways to regularly connect participants across campuses, perhaps through online programming and activities, especially if budgets are a limiting factor.

Applied teaching and teaching-related opportunities. Although most participants held early interests in teaching that preceded the NCTFP, the role of successful performance in teaching-related experiences was critical to the formation of these interests. For participants who have only recently decided to pursue teaching as a result of the NCTFP, fostering opportunities to gain applied teaching experience may be especially critical to fostering self-efficacy and intrinsic interest in the career that may help to set students up for success, and a resulting greater likelihood of retention within teaching. Considering high turnover rates among new teachers both in North Carolina and throughout the U.S., making sure all NCTFP participants gain hands-on teaching experience in supportive settings that encourage their growth is especially important to fostering existing interests and helping participants who are newly considering teaching become successful in these roles.

Alternative incentives for low-performing schools. As it currently stands, the NCTFP serves to promote Fellows' entry into low-performing schools through the incentive of faster service completion. However, findings from this study suggest a need for a critical examination of the effectiveness of this incentive. In the present study, the students most likely to stay in teaching long-term did not express strong preferences for completing their service quickly, as they anticipated being in these jobs beyond the required years of service. Instead, a faster service term was most appealing to participants who were seeking a way to exit teaching, or to leave North Carolina in pursuit of other locations and opportunities. If this is the case, is a shorter term of service the most effective way of promoting the greatest teacher talent into low-performing

schools? Instead, it seems that this incentive may direct the students least committed to the profession towards low-performing schools, schools that likely to have the greatest need for effective teachers and that already see relatively high turnover rates.

The NCTFP may reconsider the structure of this incentive and identify other ways to reward students for entering low-performing schools, strategies that might be more likely to promote students' successful transition into and retention within low-performing schools. For instance, the NCTFP could provide additional economic incentives for Fellows who enter low-performing schools. One challenge for low-performing schools in recruiting talented teachers is their relative inability to offer competitive salaries, especially in comparison to better-funded systems and districts. Rather than shorten terms of service for Fellows who enter low-performing schools, the NCTFP could provide alternative incentives such as tailored professional development opportunities, bonuses, additional loan forgiveness, and/or funding to use for classroom supplies to enable the purchasing of newer materials, technology, or whatever the teacher sees fit in a way that will directly benefit students' learning.

Alternative financial benefits such as bonuses or additional loan forgiveness could help Fellows justify taking lower salaries common in lower-performing schools. Further, by providing benefits that help to promote teacher transition, effectiveness, and longevity in these roles instead of those that help to incentive a faster exit can help direct more retainable talent into low-performing schools that are already likely to face challenges with teacher turnover. Fiscal benefits could further be dispensed annually for a certain period of time, thus intentionally promoting retention in low-performing schools, rather than entry alone. Additionally, providing provide extra enrichment activities and continued professional development and support could help address participants' uncertainties about their abilities to teach effectively in these environments. Considering that opportunities to engage in enrichment activities and become part

of a larger community of students and teachers with shared interests was attractive to participants in their decisions to participate in the NCTFP, fostering a community of teachers in low-performing schools could also serve as a perceived benefit to pursuing these positions. If Fellows were guaranteed support systems to develop and hone skills that would help them succeed in these environments, they may be more likely to consider low-performing schools from the start of the careers.

Strategies for increasing program access and diversity. While the suggestions above are derived largely from the data in the present study, the remaining sections are constructed based primarily on existing literature related to these topics. Because the NCTFP is so new, using existing work to understand and evaluate the possible implications of the policy's current structure, both in its strengths and in its opportunities, is essential to contextualizing the program's foundation and long-term success. One strength of the current NCTFP is its expanded access by education level; unlike in the original program, currently enrolled undergraduate students and bachelor's degree holders are eligible to apply. While I believe the restriction of current education students to be problematic, the opening of the program to students at a variety of points in their postsecondary education creates additional and critical access points for students with more diverse educational pathways and needs. This expansion provides the newfound opportunity for students to attend a community college for their initial years of college and then transfer into a partner institution to join the NCTFP. Given the current limited geographic diversity of NCTFP partner institutions, this option could be especially helpful in making college accessible and affordable for students across the state who would like to participate in the NCTFP but who may see a four-year institution as outside of the realm of their postsecondary options.

While this expanded eligibility is a good start towards promoting accessibility into the program, I recommend additional strategies for continuing to expand eligibility, especially considering the great need for a more racially diverse teacher workforce within North Carolina. Building a more racially diverse teacher workforce may not only help address shortage and recruitment needs by tapping into a population vastly underrepresented within the career (Bianco et al., 2011; Diekman & Benson-Greenwald, 2018), but promoting a teacher workforce that reflects student demographic characteristics can also help student achievement (Egalite et al., 2015; Egalite & Kisida, 2018; Gershenson et al., 2017; Ingersoll et al., 2014; Putman et al., 2016; Redding, 2019). This may be particularly important in North Carolina, where the vast majority of teachers in the state are White and female, demographic characteristics not representative of the state's K-12 student body, more than half of whom hold racially minoritized identities (BEST NC, 2018; NCDPI, 2015).

Expand list of partner institutions by geography. One of the criticisms of the NCTFP in its current form is the limited geographic diversity of partner institutions. This study provides evidence of the opportunity that can come along with geographic expansion, especially with Victoria's story. A first-generation college student, Victoria credits the NCTFP with her ability to attend a four-year college. For Victoria, the close proximity of a public NCTFP partner campus to her home allowed her to commute to college during her first semester, helping her to afford attendance at a four-year institution.

Currently, the NCTFP has only five partner institutions, four of which are located in the state's largest metropolitan areas, Charlotte and the Triangle area, and the fifth located somewhat between the two areas. Because the funding of the NCTFP played an important role in almost all college decisions among incoming first-year participants and the master's-level participant, greater geographic diversity among institutional partners would allow more students to take

advantage of the opportunity to combine multiple cost-saving strategies and commute from home to nearby partner institutions. Further, greater geographic diversity would help to promote the involvement and interest of rural students, who are more likely to attend college close to home (Hillman, 2016). Given that many of the state's low-resourced and low-performing schools are located in its rural mountainous and coastal areas, and that these areas may have the most difficulty in recruiting and retaining qualified teachers, a greater geographic diversity of partner institutions could help to recruit and educate students who are from these areas to fill positions in schools where quality teachers are most needed.

Promoting racial diversity in STEM education. Beyond expanding the geographic reach of partner institutions to promote accessibility to the NCTFP, the program should also consider expanding institution types represented among partner institutions. This suggestion was brought up by most campus program coordinators and reflects wide criticism that the program received upon its announcement of partner campuses. Namely, the NCTFP lacks partnership with minority-serving institutions (MSIs) such as HBCUs, missing a key opportunity to recruit racially minoritized students into the profession. Among participants choosing institutions at the time of NCTFP admission, the funding helped students to justify attending institutions that met varying interests and needs. Partnering with MSIs, especially HBCUs, can promote racial diversity within the program and postsecondary options among racially minoritized students who may want to attend an MSI and participate in the NCTPF.

Considering the importance of vicarious learning and social models in the development of self-efficacy, having a more diverse teacher workforce, especially in STEM subjects, could additionally promote the interest of future students into teaching and/or into STEM careers. Research suggests the importance of teachers, mentors, and other role models that share

demographic characteristics, such as race, with students and increasing racial representation among teachers can help students see themselves in the profession as well (Bianco et al., 2011). Racially minoritized students also remain significantly underrepresented in STEM fields (NSF, 2017) and if the NCTFP is able to promote more teachers of color into STEM education, the program would indirectly support the promotion of more students of color into pursuing postsecondary majors and careers in these subjects and industries as well.

Recruitment of diverse talent. While the original NCTFP included a goal of increasing the diversity of the teaching profession, especially in trying to recruit students of color and men, this objective was absent from the new program's legislation. Despite the original program's goal, however, a program evaluation found that the original NCTFP was not successful in meeting this objective (Henry et al., 2012). In North Carolina, racially minoritized teachers are vastly underrepresented within the teacher workforce, with far fewer teachers of racially minoritized backgrounds than students. In the current NCTFP, 83% of participants are White. As the NCTFP continues, increasing the diversity of participants appears to be a new focus, with a recent program report suggesting that "increasing gender and racial diversity...[is] a key priority as the program moves forward" (UNC System, 2019, p. 4).

In the present study, participants largely heard about the program through their connections in their high schools or current or prospective postsecondary institutions and academic programs (Appendix M). In order to increase the diversity of participants in the program, NCTFP stakeholders should consider recruitment strategies that include visiting high schools, institutions, and organizations with high proportions of racially minoritized students to share information about the NCTFP. Students cannot apply for the program if they don't know about it. Yet, for several participants who had limited financial resources to afford college, the

NCTFP became a critical means for accessing college and certain college environments. Given that low-income students and students of color often have the least access to information about college, financial aid, and more (Dynarski & Scott-Clayton, 2006), promoting this program may help students access teaching careers.

Further, Teaching Fellows from schools that are considered low-income and/or low-performing, like Zoe and Kyle, may have an inherent interest in going back to teach in these environments. Promoting the NCTFP in school environments with the greatest needs for teachers can help students in these environments envision a path into teaching. If the NCTFP wants to meet its objectives in directing talented and qualified teachers to low-performing schools, recruiting Fellows from them may be one way to promote teaching to students who may be intrinsically motivated to return to their home schools or similar school environments. The NCTFP may also consider promoting other teacher support programs that participants may be eligible for that additionally incentivize and reward entry into rural areas, low-performing schools, low-income schools, and more, especially since several participants in the present study were keenly seeking opportunities to combine resources and further reduce their college costs or total debt. Participants in the present study who were already active in multiple teacher support programs sought these opportunities on their own, but policymakers and other NCTFP stakeholders may consider ways to more strategically and systematically promote intersecting opportunities to direct teacher talent where it is most needed within the state.

De-emphasize standardized test scores in eligibility requirements. NCTFP eligibility and selection is currently based on criteria that include GPA cutoffs and/or SAT or ACT test score minimums, depending on applicants' current academic status and class year. While these minimums are not explicitly written into the policy, which broadly lists "grade point averages" and "performance on relevant career and college readiness assessments" as two of seven criteria

to inform Fellow selection decisions (NCSEAA, 2017), the NCTFP has established GPA and test score minimums: an unweighted high school GPA of 3.0 and a score of at least a 24 on the ACT or a 1100 on the SAT for incoming high school students and already-enrolled students with fewer than 24 hours of college credits, or a 2.7 GPA for students with over 24 hours of college credits (NCTFP, n.d.).

Standardized test scores as an admissions requirement notoriously benefit wealthier students (Geiser, 2015). For the NCTFP, what benefit do these score minimums offer the program? Fellows must be admitted to partner institutions in order to become eligible, yet they must also be above these minimums, creating a potential situation where a student could be admitted to a partner institution, but may also be ineligible to apply for the NCTFP. One program coordinator brought up this this concern, citing a specific student who was identified as having strong academic potential and who was adjusting well to college and interested in becoming a STEM teacher, but who had low standardized test scores. This student, of a racially minoritized and low-income background, had been accepted to the partner institution and could have benefitted from the financial support of the NCTFP, but was deemed ineligible to apply. Programs that use academic cutoff points may inadvertently limit the access of underrepresented populations into education.

It seems that if the NCTFP truly wants to recruit diverse, motivated, and committed talent into teaching, GPA and test score criteria are unnecessarily exclusionary of potential participants. The NCTFP has hand-picked partner institutions, but seemingly deems the admissions requirements of these institutions as an insufficient indicator of a student's potential talent, adding its own set of scores that a student must hold in order to be considered. Because these academic cut points do not seem to offer any explicit benefit to the program beyond helping to contribute towards the goal of recruiting "high-achieving" students, the NCTFP may reconsider

the use of SAT scores, and possibly GPA as well, as exclusionary criteria, especially considering that applicants are already screened by their respective institutions.

Reduce distal program costs and loan terms. One component of the NCTFP that participants overlooked in their discussion of the program is the high interest rates, at 8% (by comparison, the interest rates for unsubsidized federal loans is currently 5.05% for undergraduate students and 6.6% for graduate students; FSA, n.d.-f). Because participants generally expect to relieve their loans through teaching, the details of paying back loans in cash, including loan interest rates, may be less salient to participants. Further, researchers suggest relatively low levels of knowledge of and attention to loan interest rates among students (Anderson et al., 2018; Dynarski, 2014). Yet, the higher interest rates of the NCTFP are problematic because, for those who do not complete the full required teaching service for any reason, NCTFP loans come with a higher financial penalty than participants would have incurred had they taken out federal loans in the first place. It is unlikely that students are aware of this penalty. As suggested earlier in the discussion section, a cost calculator may help increase transparency in interest rate costs. Even more helpful, however, would be simply reducing loan interest rates so that students aren't penalized for participating in this program by taking out costlier loans than federal loan options.

Beyond the higher interest rates, the NCTFP comes with a 10-year repayment window without repayment options such as the income-based repayment structure available for federal loans. NCTFP participants are held accountable for paying back any loans received, even if they do not complete teacher preparation programs, or even if they do not complete a college credential at all. Considering that students who borrow, but who do not complete degrees are those most likely to default (Perna et al., 2017), the lack of flexibility for these loan terms, compounded with higher interest rates, could put NCTFP participants who do not meet service terms in precarious financial situations. Considering the significant commitment that students

make to the NCTFP to participate, reducing interest rates and offering greater flexibility or options in repayment processes may help the NCTFP to be a policy that supports all students' ability to afford college, rather than adversely affecting students' long-term financial stability and status.

A bolder (and costlier) recommendation, then, would be to drop service requirements altogether, offering the money as a scholarship instead of as forgivable loans. As it currently stands, NCTFP participants may be committing up to eight years of service in a career that many students have only limited experience in, and exposure to. As one program coordinator said, the terms of the current program ask “17-year-olds to look into a crystal ball.” Preliminary data from the original program (unfortunately, full outcome data are unavailable) suggest that at least 30% of participants did not pay their full loans back in teacher service (Cohen, 2015), and this version of the program *doubles* the length of service required unless participants enter a position in a low-performing school, which tend to have higher teacher turnover rates. Based on these figures, especially alongside outcomes from the TEACH Grant program (Barkowski et al., 2018; GAO, 2015), I worry for NCTFP participants' ability to effectively meet long-term service commitments. With a strong body of evidence suggesting that college experiences and coursework can play an important role in career development and interest formation (e.g., Brown, 2004; Lent et al., 1994, 2002; Sampson et al., 2004; Smith & Gayles, 2017), the NCTFP assumes decision making readiness and requires career commitments earlier than students may be able to make informed decisions. Further, the NCTFP is built on assumptions of time-consistent preferences when behavioral economics principles show that people are biased towards the present and often unable to predict the preferences of their future selves (Baum & Schwartz, 2015; Camerer, 2014; DellaVinga, 2009; Fudenberg, 2006).

The two private partner institutions in the present study serve as a case study to inform the feasibility and potential outcomes of a scholarship structure. When the original NCTFP was defunded, both Elon University and Meredith College retained their respective Teaching Fellows programs, offering scholarship money and enrichment activities for future teachers without requiring post-graduate commitments. Anecdotally, while not all Teaching Fellows in these programs have completed the education majors they started, the very few who left were able to do so without financial penalty (H. Bower, personal communication, November 26, 2018). While data for these outcomes are unavailable, program coordinators on both campuses are confident that most of the Fellows go on to teaching careers, and that most do so within the state. However, under current NCTFP terms, if Fellows enter teaching and find that the career is not what they expected and not a good fit, they may find themselves stuck in the career for years. Requiring a certain number of years of service can keep teachers in the classroom for the wrong reasons, with negative implications for teacher satisfaction and performance, and for students' experiences as well. Do we want to retain ineffective teachers who are stuck in roles for financial reasons?

By changing the framing of their Teaching Fellows programs as an opportunity for scholarship and professional development, both private institutions have been able to use the programs as a recruitment tool for their respective institutions and education programs. As evidence, the three participants in the present study who attended either Elon University or Meredith College selected the institutions because of these well-established Teaching Fellows programs and the accompanying teacher training and other unique opportunities they provided. As it stands, the NCTFP is a tough sell for students not already interested in teaching and/or in STEM or special education due to the substantial costs of the attached service requirements. Program coordinators and directors all mentioned difficulty in recruiting for the program in 2018 due to these stipulations. If the NCTFP wants to recruit students who wouldn't have otherwise

considered teaching careers into the field, providing the benefit without the attached service costs may provide a lower-risk way for students to gain exposure to teaching careers, continuing if they found that the careers were a good fit, but providing no penalty if not.

From a marketing and communications perspective, such a structure would allow for North Carolina to promote its financial commitment to teachers through offering scholarships for entry into the field, likely increasing program interest and profile. Participants in such a program would then be given an escape route if, at any point during or after their education, they found that the career was not a good fit. This structure would additionally protect the interests of K-12 students in that the teachers who stay in the field are those who are intrinsically driven and committed to the work. While the above suggestions would require significant fiscal resources and a reorganization of existing policy structure, if successful, these strategies represent an important investment in teacher recruitment and retention. Some researchers suggest that teacher attrition is the most important problem facing teacher shortages, and a greater investment of recruiting and training committed and talented students towards these professions may cost more upfront but could ultimately save the state money long-term while continuing to promote the image of teacher careers within the state.

Data and longitudinal outcome tracking. In my attempt to provide a full context for the outcomes of the original NCTFP, I learned that a full set of data on former participants was unavailable, due in part to the changing ownership of the program. While the former version was led by the Public School Forum of North Carolina, the current version is operated by the state and records of former program participants are dispersed between the two. This is unfortunate; data on participants of the original program could have provided important insight into outcomes and trends that would be useful for informing the structure of the present policy. Regardless, the new policy is different in a number of key ways. Tracking participation and outcomes, including

program completion, service, and cash payment of forgivable loans as the program matures will provide critical insight into program effectiveness and opportunities for continued improvement in the interest of both students and the state.

Implications for Theory

The present study uses two theoretical frameworks, social cognitive career theory and behavioral economics concepts to address research questions about the development of career interests in STEM education and the role of the NCTFP in academic and career decisions. Findings from this work generate implications for the continued refinement of theory and the use of these theoretical concepts in future work.

In using SCCT, I focused predominantly on the construct of self-efficacy, a key contributor to an individual's formation of career interests in the model, both directly and indirectly, as moderated by outcome expectations. While not visible in the depicted model (see Figure 2.1), SCCT acknowledges four sources of self-efficacy: performance and accomplishments, vicarious learning, social persuasion, and physiological and affective states from Bandura's social cognitive theory (Lent et al., 2002). Data provided evidence of all four of these sources of self-efficacy in participants' development of interests in teaching, in STEM, and in interests (and disinterests) in other subjects. Throughout interviews, examples of positive and negative examples of each source of self-efficacy were evident except for physiological and affective states where only positive examples were evident. Participants often used words like fulfilling, happy, and proud when they described their teaching-related experiences to date and their expectations for the career in the future. While this language reflects positive affect, it is also an emotional state experienced as a result of performance. While SCCT differentiates performance and somatic experiences as separate sources of self-efficacy, the two aligned closely in the present study.

In addition to overlap between positive affect and performance, I saw evidence of an intersection between social persuasion and vicarious learning, especially when social models were the sources of verbal persuasion for participants. In the present study, one of the most confusing parts about choosing teaching careers for participants was that, in some cases, the teacher social models that students sought to emulate were the same individuals who advised them not to enter the profession. This experience was especially confusing for participants who had long-standing interests in teaching careers and who saw their teachers as effective in this career. Thus, participants relied on identifying differences between themselves and the social models who gave this advice, focusing more on family and fiscal dynamics of the social models rather than the advice itself. As the impact of vicarious learning experiences vary depending on an individual's assessment of similarity between themselves and the social model, this similarity may also have implications for social persuasion and the weight of a person's advice on participants' career development and decisions.

Negative social persuasion in the present sample focused predominantly on extrinsic factors related to challenges in teaching work. While receiving negative feedback from teaching-related tasks could have deterred other students from considering teaching careers, these experiences were not represented in the present study, likely because all participants have self-selected into education majors and career paths. Instead, negative social persuasion focused on contextual factors that could undermine participants' success and longevity in the career. Thus, social persuasion can serve not only as a source of self-efficacy but as a component of the contextual factors situated with a proximal influence on career goals, actions, and attainments. Social persuasion that focuses on extrinsic factors can have the potential to undermine self-efficacy, detracting from participants' confidence in their ability to succeed in these careers as a result of less-than-ideal extrinsic and contextual factors regardless of their own skills.

While the SCCT can be instrumental for understanding career development and the importance of experience in the development of self-efficacy and resulting interests, it fails to capture the cost/benefit analysis associated with decisions, especially considering the salience of salary and other economic factors in decisions related to job opportunities. SCCT falls short in capturing the role of economic factors on decisions, completely failing to acknowledge that extrinsic factors may generate career interests, as was the case for two participants in the present study who became interested in teaching as a result of the NCTFP. While both participants are confident in their abilities to become successful teachers, these ideas were not founded in self-efficacy and experience. Instead, extrinsic factors led to career-related commitments and actions, which are now leading to learning experiences in teaching. For Christy and Kyle, teaching experiences are being acquired *after* their respective academic commitments to teacher preparation programs, creating a development process that deviates from the linear SCCT model. Findings from the present study, then, suggest that extrinsic factors have the potential to generate career interest.

Given SCCT's foundation in and formation from quantitative research (Lent et al., 1994), qualitative research may be especially instrumental to defining career development processes not already depicted within the current SCCT, such as the potential connection between extrinsic or contextual factors and the generation of interest. While findings in the present study support the importance of learning experiences to the development of self-efficacy and career interests, the interests that an individual has may vary over time. As it stands presently, the SCCT does not depict a cyclical relationship between learning experiences and interest formation, as is evident in other career models, such as the Career Information Processing model (Sampson et al., 2004). Qualitative research may be especially useful for exploring how students navigate and cycle

between different constructs represented in the model over time, especially considering the iterative nature of career development.

SCCT and behavioral economics principles overlap most closely in the SCCT's acknowledgment of contextual factors that influence career goals, actions, and attainments. However, SCCT lacks specificity in defining these relationships. Supplementing SCCT with theory that better addresses specific decision processes is helpful in research that extends beyond career development to also understand academic and career decisions critical to college students' experiences and outcomes (e.g., Smith & Gayles, 2017). To supplement SCCT, I adopted Weimer's (2017) approach to behavioral economics: concepts of behavioral economics and instances of bounded rationality can be understood *alongside* traditional economics theory related to rational choice. This perspective allowed me to understand the costs and benefits participants identified related to participating in the NCTFP while also identifying instances of bounded rationality in the decisions made.

"Behavioral economics" is a term used widely to connect a set of theories, as there is currently no cohesive theory that encapsulates all concepts related to this subfield of economics and psychology. While such principles may have been long-used in economics research, they have only reached education research more recently despite their strong potential to inform postsecondary decisions that include college choice, financial aid program application and participation, and more (English, 2018; Gandhi, 2008). While behavioral economics may include many theoretical constructs, I use just a small number of constructs to inform this study: information access and processing, including cognitive overload and simplifying strategies, framing effects, and time-inconsistent preferences. These concepts were selected based on their expected relevance to decisions and were used deductively in category-centered analysis.

As a number of researchers in economics and education identify, experiences of cognitive overload can be particularly common among college students due to the complexity of college and career decisions and students' relative lack of experience in these domains (Castleman et al., 2015; Dynarski & Scott-Clayton, 2006). This was highly evident in the present study. Not only were participants making difficult decisions related to their college attendance and academic and career choices, but these decisions were frequently based on limited information. While there was no explicit behavioral term that I encountered to describe a lack of information, this was perhaps the strongest example of bounded rationality demonstrated by participants in decision making. Students chose to participate in the NCTFP despite lacking critical pieces of information about the benefits they would receive and/or the costs they would incur. A major challenge, however, was that students either did not know that they were missing this information, or they recognized their own uncertainty but did not successfully access the resources to clarify program terms, even if they actively tried to do so (as in the case of Kristen asking multiple people about their interpretation of the NCTFP's 10-year timeframe for teaching service). Unfortunately, the framing of bounded rationality highlights individuals as irrational consumers when this critical lack of communication and misinformation may be of no fault of their own. Sociological and educational research demonstrates trends in how students know about and navigate college environments, and evidence here shows that some participants were lacking important information even after actively searching for it.

Even when participants were not actively searching for missing information, the way in which information is communicated, or framing effects, can also have important influences on students' decisions (Dynarski & Scott-Clayton, 2006). In the present study, I use framing effects to situate the marketing of the new NCTFP within the context of the old program, with framing

effects in this case referring to the emphasis of some characteristic of the program (Levin et al., 1998). Framing effects helped to inform my understanding of how participants first learned about the NCTFP and initial perceptions of the costs and benefits of participating in the program, although this was somewhat difficult to assess in the study's timeframe, with interviews taking place over a year after participants would have first learned about the NCTFP and decided to apply. Matilda, for example, remembered learning about the program on Facebook, but could not remember who had shared this information. Framing effects principles could be especially useful in case study research designs where marketing materials are available and analyzed alongside participant data.

Additionally, while the official framing of the NCTFP was important to students' understanding of the program, perceptions were also mitigated by the personal accounts of family members, teachers, and other advisors, and further influenced by students' long-term knowledge of the original program among those who were familiar with it. Framing effects can then be manipulated not only by official sources, but by those who communicate and share information. Because college students may be especially reliant on the accounts and advice of others as they wade through highly complex postsecondary decisions, the construct is somewhat difficult to isolate and analyze in research relating to college students but can also offer critical insight into how the communication of policy may affect students' understanding of it.

The final behavioral economics construct that informed the present study, time-inconsistent preferences, offers important insight into outcomes for loan forgiveness policies that provide funding upfront in exchange for future commitment. Research on the TEACH Grant program suggests that students who may have originally planned to teach in high-needs subjects and schools may not complete all service terms because, for some, plans and interests change (Barkowski et al., 2018). Time-inconsistent preferences also fit career development concepts that

identify college as a place for significant learning experiences and exposure to different fields, career options and skills, as well as reconsidering existing plans (Lent et al., 1994, 2002; Lichtenstein et al., 2009; Sampson et al., 2004; Smith & Gayles, 2017), perhaps best evidenced by the commonality of students changing majors in college (Astorne-Figari & Speer, 2019; Chen, 2013).

While participants' academic behaviors were observable (college choice, academic majors), career behaviors remained speculative for all participants. Thus, time-inconsistent preferences are most useful to the present study in considering potential faults in the foundational assumptions behind the NCTFP and the likely possibility that participants may not meet program conditions based on existing evidence from other programs such as the former NCTFP and the TEACH Grant (Barkowski et al., 2018; Carter, 2018; CFPB, 2017; Cohen, 2015; GAO, 2015; Lobosco, 2018; NCOSA, 2003; Turner & Arnold, 2018a, 2018b). Time-inconsistent preferences also helped to frame participant confidence, as overconfidence is common, but may not be an accurate indicator of whether participants actually complete the service they have committed to. Yet, participants maybe unaware of these outcomes due to both limited information and the framing of the former NCTFP as a success in program marketing and in research that cites the program as a model. Thus, the interaction between each of these concepts is especially useful in understanding each of their applicability to the current contexts and future plans of students, offering important framing for future research examining and understanding career behaviors.

Future Research

While the present study helps to understand the structure of the NCTFP with career development theory and behavioral economics principles, it tells only part of a much larger story. Five study participants are in their first year of college. While all participants in this study have completed some teaching-related experiences through tutoring, classroom observations, school

visits, etc., none have actually served as teachers or even yet completed student teaching.

Existing literature on education students and new teachers suggests high turnover rates in the major and in the profession and it remains to be seen whether the participants in this study will actually take the pathways they envision for themselves. Time-inconsistent principles and data from the original NCTFP, and from similarly-designed programs like the TEACH Grant, suggests with some likelihood that not all participants will complete these requirements.

Future research, then, would benefit from a longitudinal perspective. I hope to carry out a follow-up version of this study in approximately five years, after most, if not all, of the participants have completed college and have made initial decisions and commitments related to the workforce or continuing education. A 10-year follow up would provide even more insight into students' abilities to predict their own pathways and would provide insight into retention and progress in loan forgiveness. Existing research on the original NCTFP showed a positive correlation between NCTFP participation and retention in teaching jobs in public schools in the state (Henry et al., 2012), but the present program has a different structure with more narrow service requirements that could double the original length of service required unless participants enter low-performing schools, which tend to see the highest turnover. All participants have granted me permission to follow up in the future.

Another research opportunity related to understanding longitudinal career pathways and outcomes as they relate to Teaching Fellows in North Carolina would be comparing NCTFP participant outcomes with those of students who participate in Teaching Fellows programs at the two private partner institutions. With the reestablishment of the NCTFP at Elon University and Meredith College, two campuses that simultaneously maintain their own private Teaching Fellows programs, future research could explore outcomes between students in the private program and the NCTFP, especially considering the similar enrichment experiences students will

have across private programs and the NCTFP, with the experiences diverging primarily in the basis of their funding amount and post-graduate service requirements. How do graduates of the private Teaching Fellows programs differ in their career interests, goals, and behaviors, including their decisions to enter and stay in teaching careers, and in the types of schools they enter, compared to those in the NCTFP? Although samples are small at this point, a comparative case study analysis between these two groups may offer useful insight into the role of post-graduate service requirements in students' motivations for entering these programs and in making career decisions post-graduation.

Additional future research on the NCTFP may focus on special education participants in the NCTFP. While the present study looks only at STEM students, it is likely that the motivations, interests, goals, and behaviors of students pursuing the program with plans to enter special education may be different. If this is the case, conducting similar research on special education students in the NCTFP may reveal differential career development and decision making as it relates to the NCTFP. As North Carolina continues to see teacher shortages in special education across the state, understanding the unique experiences of students pursuing these areas is essential to effectively meeting students' needs and continuing to enhance successful recruitment efforts.

One finding that arises in the present study is the commonality of participants' receipt of advice not to enter teaching. As this study includes only students who chose to enter teaching in spite of these discouraging comments, it remains to be seen how this type of feedback may have actually deterred other prospective students from choosing teaching majors and careers. Future research may explore the role of this negative social persuasion for teaching careers among students who chose not to enter a teaching career, perhaps by recruiting participants who left education majors to best understand their reasons for doing so. Those who start college in

education majors presumably have a pre-existing interest in the career, and losing prospective talent in college, especially those with high self-efficacy for teaching-related tasks and experiences, seems like a critical population to target in larger attempts to build the teacher pipeline, both in North Carolina and across the U.S.

Further, while analyzing the role of identity on career development and decisions was outside the scope of this study, additional research on this topic may seek to understand perceptions of teaching careers based on characteristics such as race, socioeconomic status, or geography. Given existing work that shows that sociocultural variables and demographics can influence students' experiences in school and perceptions of their teachers (Bianco et al., 2011; Egalite et al., 2015; Egalite & Kisida, 2018; Gershenson et al., 2017; Ingersoll et al., 2014; Putman et al., 2016; Redding, 2019), additional work in this area could help maximize recruitment of populations currently underrepresented within the teaching careers. I recommend that future work that examines identity and teacher career choice use a theoretical model that acknowledges intersectionality and that differentiates identity and predispositions, concepts that are somewhat conflated in the SCCT model (Gayles & Smith, 2019).

Next, to best understand the effectiveness of loan forgiveness programs, quantitative analysis is also needed. Hopefully, as suggested above, the NCTFP will maintain data on program participants through their education and through the duration of teaching service and/or cash repayment of forgivable loans. The first program participants to finish their education programs and begin paying back their NCTFP forgivable loans through service, such as Felicity, could graduate as early as this semester and begin teaching by Fall 2019. Tracking outcomes among these early graduates, and among larger cohorts of future graduates will allow for timely

measurement of initial post-graduate outcomes, allowing for future evaluation and analysis of program outcomes.

While the NCTFP is an interesting case study in the context of loan forgiveness programs, especially those designed to recruit and retain teachers, it is not the only program of its kind. Data and research on loan forgiveness programs are sorely needed, especially given the prevalence of these programs at all levels of government, including four versions of loan forgiveness programs for teachers operated by the federal government (Appendix A). Yet, research on all of these federal programs, on the NCTFP, and of other teacher recruitment programs is severely lacking, due in part to the limited availability of outcome data, and the limited accessibility of data to researchers. While steps have been taken to include measures related to these programs in national surveys (e.g., the addition of a TEACH Grant variable and a PSLF variable in the 2008 Baccalaureate & Beyond Survey), additional data are needed. Although each policy has its own nuances, beginning to understand the impact of loan forgiveness and similar incentive programs on all facets of students' college choice, enrollment, selection of academic programs, and career plans can help policymakers to better meet student needs, especially in the postsecondary context of rising college costs. Ensuring that financial aid policies effectively support participating students has the potential for widespread consequences, especially when the result could lead to the recruitment of talented students into teaching jobs that have critical implications for the U.S. education system at all levels.

Summary

This narrative case study explored how 10 participants the North Carolina Teaching Fellows Program came to choose their current academic programs and participate in the inaugural year of the re-introduced state-level teacher loan forgiveness program. Participants are

preparing for careers in secondary STEM education and represent a diverse set of backgrounds and academic experiences across all five of the program's partner campuses. Themes within each individual's life course, and across participants, revealed the role of self-efficacy in the development of career interests in teaching and the cost/benefit decision processes that led to students' participation in the NCTFP. Given that decisions are rarely rational, and the format of the program where the benefits are proximal and the primary costs are distal, limitations in rational decision making were additionally analyzed.

In spite of the NCTFP aiming to serve as a teacher recruitment program for students who otherwise may not choose these careers, findings suggest that this program may be most appealing to prospective and current students whose academic and career interests already align with some or all of the program's requirements. For students whose goals already match these stipulations, costs to participating are perceived as low overall; no major sacrifices were made in order to participate and minimal costs are perceived in students' plans to meet program service requirements. Steeper participation costs are perceived by those whose goals do not already align with those of the program, especially for students who were not already considering a career in teaching. While this study provides evidence that the NCTFP may be able to effectively recruit students who would not otherwise consider teaching into the career, the long-term commitment of these students to the field may be limited. The NCTFP may serve as a more compelling reason for participants to consider careers in specified subject areas (STEM or special education) and/or to stay in state after graduation. Although the NCTFP aims to promote student entry into teaching roles in low-performing schools, student participants were least sure of the types of schools where they would seek jobs following their degree completion.

This paper's discussion highlights major findings and policy implications. The NCTFP might reconsider its restriction of education students from applying to the program, thus better prioritizing the recruitment of intrinsically-motivated students who will stay in the profession rather than those who are motivated by extrinsic factors alone and who, therefore, may be less inclined to stay in teaching. Similarly, the NCTFP may also consider strategies that inspire and facilitate self-efficacy and interest in teaching among both prospective and current students. Findings from the present study revealed that many students developed an interest in teaching prior to college, with interests often generated at early ages. Yet, students don't typically gain teaching experience until they become student teachers and/or enter the career. Thus, the NCTFP asks for students to commit to teaching careers before they have taken education courses or gained substantial experience in these roles. Reaching students before college and/or providing additional applied experiences and enrichment activities to build teaching skills across school contexts should be a continued focus for the program to continue to develop students' self-efficacy in the career.

Participants in the present study demonstrated a limited understanding of all program terms, highlighting a great need for the NCTFP to better communicate and promote its requirements among prospective and current participants. Participants were unsure of teacher service expectations, the meaning of teaching in low-performing schools, and more. Providing more information, especially upfront but also regularly through participants' engagement in the program can help to clarify expectations and support participants making informed decisions. While this study provides evidence that the NCTFP can serve as an effective recruitment tool for promoting students' entry into STEM education programs, an important limitation of the study is that these career pathways and loan forgiveness completion have not yet been actualized. There

is great opportunity for continued research on the NCTFP and programs like it in the interest of not only recruiting diverse and talented students into teaching careers, but in supporting their success and longevity within these important roles.

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APPENDICES

Appendix A

Table A1

Federal Loan Forgiveness Programs for Teachers

Program	Eligibility	Amount Forgiven
TEACH Grant	Students must be enrolled as an undergraduate, postbaccalaureate, or graduate student at a participating institution in an eligible program. Students must complete a FAFSA and meet basic eligibility criteria for federal student aid programs. Students must meet academic achievement requirements such as scoring above the 75th percentile on one or more portions of a college admissions test or maintaining at least a 3.25 cumulative GPA. Students must serve as a full-time teacher for at least 4 academic years within 8 years of completing their degree at a qualifying low-income school or education-based service agency in a high-need field. High need fields include bilingual education and English language acquisition, foreign language, mathematics, reading specialists, science, special education, and other programs deemed high-need by federal, state, or local governments.	Provides up to \$4,000 in grant aid per year (FSA, n.d.-a). Grants disbursed from Oct. 1, 2017 through Oct. 1., 2018 may be a maximum of \$3,736, and grants disbursed from Oct. 1, 2018 through Oct. 1., 2019 may be a maximum of \$3,752. Failure to meet program conditions results in the conversion of grant money to loans, with interest based on disbursement date.
Teacher's Loan Forgiveness Program	Participant must be a highly qualified (have at least a bachelor's degree and full state certification) full-time teacher in a low-income school or educational service agency for five complete and consecutive years, with at least one of the five years after 1997-1998. Direct or Stafford federal loans are eligible.	Math or science secondary teachers and elementary and or secondary special education teachers may have up to \$17,500 forgiven. Teachers of other areas are eligible for up to \$5,000.
Perkins Loan Cancellation for Teachers	Participants are eligible if they teach either a low-income school or may be eligible if they teach in shortage areas (e.g., math, science, foreign languages, bilingual or special education) determined by state education agencies. Perkins Loans are eligible.	Full loan amount may be forgiven after 5 eligible years of service. Loans are canceled incrementally: 15% for each of the first and second years, 20% for each of the second and third years, and 30% canceled for the fifth year.
Public Service Loan Forgiveness Program	Participants must work full-time at a qualifying non-profit, government, or for another qualifying organization. Borrowers must make 120 qualifying monthly payments on their loans.	The full remaining loan balance.

Note. (FSA, n.d.-b, n.d.-d., n.d.-g, n.d.-h). While it is possible for teachers to participate in more than one program, they cannot do so simultaneously.

Appendix B

Gatekeeper Recruiting Email

Subject: *NCTFP Dissertation--Recruitment Email for Student Participants*

Hi [Program coordinator name],

Following up on my recent email--I have received institutional review board approval for my dissertation research (attached) and am excited to move forward!

I would greatly appreciate your help in recruiting eligible participants from [institution] to participate in the study. I have included a bit more information below about the logistics of the study, and of participation, and have drafted text for a recruiting email that you can send to your students (see at the bottom).

Criteria for participation include:

1. Participant must be over age 18
2. Participant must be a member of the NC Teaching Fellows Program
3. Participant must be preparing for a career in secondary STEM education

Based on my proposed methodology of narrative inquiry, which necessitates a small sample to allow for in-depth exploration, I am seeking to interview no more than 10 Fellows in total.

To participate, Fellows will be expected to:

1. Complete a brief background survey that demonstrates their interest in participating
2. Complete a 90-minute in-person interview (I will travel to the student's campus)
3. Complete a shorter interview (45-minute max) at the end of the semester

If interest among Fellows exceeds capacity, I will select study participants from survey respondents who represent diverse background experiences and professional goals.

Participants will be compensated \$40 total in Amazon gift certificates (\$25 for the first interview and \$15 for the second) in appreciation for their time.

Based on our prior conversations and your relationship with the students at [institution], I would really appreciate your help in sharing information about this project among eligible students. Suggested text for the recruiting email is below.

Thank you again for your partnership and your interest in my work. I am excited about this project and the continued development of the NC Teaching Fellows program.

Please feel free to send any questions my way.

Thank you!

Sincerely,

Katie Smith

Below is the recommended email text for program coordinators to send to their Fellows who are preparing for secondary STEM teaching careers. Please feel free to add introductory/concluding

text as you would like based on how you typically address your students. However, for consistency between campuses, I ask that you do not edit the details about the study.

Recommended subject:

STEM NC Teaching Fellows: Participate in a Research Study, Earn \$40!

Email text:

Hello all,

I would like to share an opportunity to participate in a research study about the North Carolina Teaching Fellows program. The research is being conducted by a doctoral student at NC State, Katie Smith, and she has asked that I pass this information on to you. If you are interested in the study and selected to participate, you will receive \$40 in Amazon gift cards for your time.

The study focuses on the career development and decisions of NC Teaching Fellows, including the development of your interest in teaching, in teaching STEM subjects, and the role of the NCTF program in your decision to pursue this career path. Participation in the study will require two interviews: a 90-minute interview in February and a 45-minute follow up interview in the second half of the semester.

Criteria for participation include:

1. Participant must be over age 18
2. Participant must be a member of the NC Teaching Fellows Program
3. Participant must be preparing for a career in secondary STEM education

If you are interested in participating, please complete the brief online survey at the link below:

[Insert Qualtrics link]

Katie has asked me to mention that the capacity for the study is limited and only a small number of Fellows across the state will be able to participate. By completing the survey above, you will express your interest in participation and Katie will follow up soon to either schedule an interview or to let you know that the capacity has been reached.

You may send any questions about the project directly to Katie at knsmith8@ncsu.edu.

Thank you!

[Your name]

Appendix C

Initial Interest Survey for Participation

Please complete the following form if you are interested in participating in a research study about your plan to enter a career in STEM education and your interest in participating in the NC Teaching Fellows program. Please answer questions honestly, as a diversity of motivations and goals will help enrich the results of this research.

This study will include only a small number of participants and if interest exceeds capacity, you may not be invited to participate.

Selected participants will be asked to conduct two interviews with the principal investigator during Spring 2019. The first interview will be a 90-minute in person interview, and you will receive a \$25 Amazon gift certificate upon interview completion. The second interview will take a maximum of 45 minutes and may take place over the phone, virtually, or in person. Participants will receive a \$15 Amazon gift certificate for completion of the second interview. Participants are also invited to voluntarily share any documents that may provide additional insight into the development of your career ideas, including your application materials to the NC Teaching Fellows Program and your blog posts from events this academic year.

If you have any questions about this project, please email Katie Smith at ksmith8@ncsu.edu.

1. I am at least 18 years of age:
 - Yes
 - No

2. I am a current participant in the North Carolina Teaching Fellows Program:
 - Yes
 - No

3. I am preparing for a career in secondary STEM education:
 - Yes
 - No

(If respondent indicates “no” to any of the above questions, the survey will automatically end and display the following message: “Thank you for your interest in the current research project, but you are ineligible to participate.” If the respondent meets survey criteria, the survey will proceed to next page with the following questions)

4. What is your current class year?
 - First year
 - Sophomore
 - Junior
 - Senior
 - Graduate student
 - Other: _____

5. Which institution do you currently attend? If you attend more than one, choose the institution where you are affiliated with the NC Teaching Fellows Program:
- Elon University
 - Meredith College
 - NC State University
 - UNC Chapel Hill
 - UNC Charlotte
 - None of these
6. (*If undergraduate*): Did you transfer into this institution after first attending college elsewhere?
- Yes
 - No
7. (*If transferred*): To what extent did the opportunity to participate in the NC Teaching Fellows program influence your decision to transfer to this institution?
- Very much
 - Somewhat
 - Not much
 - Not at all
8. In what county and state did you attend high school? (e.g., Alamance County, NC)
-
9. What do you believe your top motivation was for applying to the NC Teaching Fellows program? (*100 word maximum*)
-
10. What subject(s) do you hope to teach after completing your degree?
-
11. How certain do you feel that you will complete all post-graduate teaching service requirements of the NC Teaching Fellows program in order pay your loans back?
- Very certain
 - Fairly certain
 - Uncertain
 - It is unlikely
 - It is very unlikely
12. Do you plan to teach in a low-performing school after you complete your degree?
- Yes
 - No
 - Not sure/haven't decided

13. Is there a specific school district where you are hoping to teach after graduation?
- Yes
 - No
 - Not sure
14. *(If yes)* Which district do you hope to teach in after your graduation?
- _____
15. If you had not been selected for the Teaching Fellows program, would you have still planned to become a teacher?
- Yes
 - No
 - Not sure
16. Please indicate your gender:
- Female
 - Male
 - Trans man
 - Trans woman
 - Other (please specify): _____
17. Please indicate your race (select all that apply):
- American Indian or Native American
 - Asian
 - Black or African American
 - Hispanic or Latino
 - Native Hawaiian or other Pacific Islander
 - White
 - Other (please specify): _____
18. Email address*: _____
- *By providing your email address, you are consenting to receive further communication about participation in this project.*

Concluding message:

Thank you for your interest in this project! The researcher will get back to you soon regarding next steps.
If you have any questions, please contact Katie Smith at knsmith8@ncsu.edu.

Appendix D

Participant Communication

Note: Reminder email text (1-2 reminders prior to each interview) are not included below.

For Participants who Completed the Initial Interest Survey and Who Have Been Invited to Interview:

Subject: NCTFP Research Interview Information and Scheduling Request

Thank you for your interest in participating in my dissertation research on the career decisions and experiences of current NC Teaching Fellows!

I would like to invite you to participate in the study if you are still interested in doing so. I believe that your career experiences and ideas will provide an especially useful perspective to include in this project.

In order to participate, you will be expected to participate in two interviews in Spring 2019 and you will receive \$40 in Amazon gift certificates in appreciation for your time and participation. The first interview will be held within the next month and will last for up to 90-minutes. The interview will be held in-person on your campus and you will receive \$25 for your time.

The second interview will take place later in the semester and may be held over the phone, virtually, or in person. The second interview will last up to 45 minutes and you will receive \$15 for your participation. Both interviews will be audio recorded. I ask that you commit to both interviews before proceeding.

If you are interested in participating, I would like to go ahead and schedule a time to meet for the first interview. The interview may be conducted in (**suggest libraries for appropriate campus**), depending on your preference. Please let me know which of the following times would work best for your schedule over the coming weeks:

(add times)

The first interview will consist of multiple parts. First, we will discuss the study and you will be asked to complete a consent form. Second, you will be asked to complete a 15-minute timelining activity, where you will create a timeline of key events and experiences that influenced your career choice. Next, we will proceed to a series of questions, both about the timeline that you created and then more specifically about your decision to enter teaching, to enter STEM education, and your decision to participate in the NC Teaching Fellows Program. Finally, you will be asked to complete a brief questionnaire to provide additional insight into your educational history and demographic identities. You will receive the first gift card at the conclusion of the interview.

One of the goals of this research is to understand your career ideas at different points in your history. As such, I am asking participants to voluntarily share any materials that may provide insight into your experiences. For instance, if available, your application materials used to apply to the NC Teaching Fellows program would be especially useful to this project. Second, your blog posts from the program experiences that you've had thorough this academic year may provide additional insight. Sharing these materials is optional to your participation in the research project but is highly encouraged. You are additionally invited to share any other materials that you believe may provide insight into your career development and ideas, and participation in the North Carolina Teaching Fellows program. You may send these documents electronically to me at knsmith8@ncsu.edu or may bring copies to the interview meeting.

Please note that any materials shared, your timeline, and any information shared through the interview or the demographic survey will be saved securely and kept confidential. Your name, nor any identifying information, will be included in the final report. In the final report, you will be referred to by a pseudonym, which you will have the opportunity to choose, if you would like.

Once I have conducted preliminary analyses, I will reach out to schedule the second interview. During this time, you will have a chance to review your initial responses and provide further depth to the experiences that you have described,

Your participation in the study is voluntary will not affect your status as a student at (**insert institution**), nor as a participant in the NC Teaching Fellows program in any way.

If you are interested in proceeding with participating, please respond with your availability during the times listed above.

Additionally, please let me know if you have any questions about this project prior to moving forward.

Thank you again for your interest! I look forward to connecting further.

Sincerely,
Katie Smith

Participant Second Interview Invitation:

Subject: NCTFP Research Study Second Interview

Dear (**name**),

I am following up to schedule our second interview for the NCTFP research study. I really enjoyed our first conversation and I am excited to share my preliminary analyses.

The second interview will be a different format from the first. You can expect this interview to last no longer than 45 minutes, and you may choose whether it is most convenient to meet over the phone, virtually, or in person. During this conversation, we will go over the information you shared in the first interview and you may provide any updates or edits to the timeline or the experiences that you described. You will also have the opportunity to provide feedback on the initial write up about your experiences.

Your timeline, interview transcript, any supporting documents you have shared, and the preliminary analysis can be found at this secure link. You and I are the only people who have access to this data:
(**add link**)

I highly recommend reading through the analyses prior to the interview.

Please let me know which of the following times would work best for your schedule the second interview over the coming weeks:

(**add times**)

Please also confirm whether you would prefer to conduct this interview over the phone, virtually, or in person. If virtually, please select the platform you are most comfortable with: Skype, Google Hangout, or Zoom. This interview will also be audio recorded.

You will receive a \$15 gift card at the conclusion of this interview, which concludes your participation in this study.

Additionally, I would like to remind you of the opportunity to submit any materials that may provide insight into your experiences. For instance, if available, your application materials used to apply to the NC Teaching Fellows program would be especially useful to this project. Second, your blog posts from the program experiences that you've had thorough this academic year may provide additional insight. Sharing these materials is optional but is highly encouraged. You are invited to share any other materials that you believe may provide insight into your career development and ideas, and participation in the North Carolina Teaching Fellows program. You may send these documents electronically to me at knsmith8@ncsu.edu or may upload them to the secure drive at the link above.

Thank you again for your interest and participation, I look forward to speaking again!

Sincerely,
Katie Smith

For Participants Who Completed the Initial Interest Survey and Were Not Invited to Interview:

Subject: NCTFP Research Interest Follow-Up

Thank you for your interest in participating in my dissertation research on the career decisions and experiences of current NC Teaching Fellows, I greatly appreciate both your support and your completion of the initial interview survey.

Interest in participation in the study far exceeded capacity. As such, I have created a waitlist of participants, including yourself, who are an excellent fit for the study but who I may not be able to interview given methodology constraints. If this changes, I will follow up immediately with additional information.

Thank you again for your interest and please reach out if you have any questions. I would love to continue to conduct research on the Teaching Fellows program in the future and will keep your interest in mind! I wish you the best of luck going forward in your academic career!

Sincerely,
Katie Smith

Appendix E

Informed Consent Form

Title of Study: Career Narratives of North Carolina Teaching Fellows

Principal Investigator: Katie Smith

Faculty Sponsor: Dr. Joy Gayles, Dr. Paul Umbach

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of this research study is to gain a better understanding of [complete this sentence with a few words describing the purpose of your investigation].

You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those who participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above or the NC State IRB office as noted below.

What is the purpose of this study?

The purpose of the study is to understand the career development of students participating in the 2018-2019 North Carolina Teaching Fellows Program.

Am I eligible to be a participant in this study?

In order to be a participant in this study you must be over the age of 18, be currently enrolled at one of the five NC Teaching Fellows institutions, and be a member of the North Carolina Teaching Fellows program planning to enter a career in secondary STEM education. You cannot participate in this study if you do not meet these three requirements.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to conduct two interviews with the principal investigator. The first interview will take place in person on your campus and will last up to 90 minutes. The first interview will include a timelining activity, interview questions, and a brief survey about your education history and demographic characteristics. You will receive an Amazon gift certificate of \$25 for your participation in this interview. At the time of the interview, you will be invited to voluntarily submit any materials that you believe may provide insight into your interests and participation in the North Carolina Teaching Fellows program. Materials that you may consider submitting include a copy of your application to the NC Teaching Fellows program or blog posts that you wrote about program experiences.

The second interview will take place in late Spring 2019 and will last approximately 45 minutes. The second interview may take place over the phone, virtually, or in person. At this time, you will be invited to reflect further on your initial contributions and on preliminary study results.

Risks and Benefits

There are minimal risks associated with participation in this research. There are no direct benefits to your participation in the research. The indirect benefits are contributing to the understanding, development, and ongoing success of the North Carolina Teaching Fellows program and similar programs designed to promote student entry into teaching careers.

Confidentiality

The information in the study records will be kept confidential to the full extent allowed by law. Data will be stored securely on an NC State managed computer. No reference will be made in oral or written reports which could link you to the study.

Compensation

For participating in this study, you will receive Amazon gift certificates in total of \$40; \$25 for completing all components of the first interview, and \$15 for the second. If you withdraw from the study prior to the completion of the interview, you will not receive compensation. Submission of any supporting documents is voluntary and will not affect your compensation in any way.

What if you are a [Insert Partner Institution] student?

Participation in this study is not a course requirement and your participation or lack thereof, will not affect your class standing or grades at [partner institution]. Participation in this study is also not a requirement of the North Carolina Teaching Fellows program and will not affect your status within the program in any way.

What if you have questions about this study?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact the researcher, Katie Smith at knsmith8@ncsu.edu.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB Office via email at irb-director@ncsu.edu or via phone at 1.919.515.4514. You can also find out more information about research, why you would or would not want to be in research, questions to ask as a research participant, and more information about your rights by going to this website: <http://go.ncsu.edu/research-participant>

Consent to Participate

“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

Participant's signature _____ **Date** _____

Investigator's signature _____ **Date** _____

Appendix F

Interview Timelining Activity Instructions

To get the interview started and before I ask any questions, I'd like to start by doing a timelining activity.

For this activity, I would like for you to create a timeline that shows the key events that influenced your career interests throughout your life, including those related to your current career goals. This may include key events or experiences in your personal or academic life, in your work history, in critical interactions with others, or even larger events that occurred in your community, state, or beyond that influenced your career pathway.

It may help to think specifically about any events or experiences that helped inspire your interest in becoming a teacher, in teaching STEM education more specifically, and/or in applying for the NC Teaching Fellows program. You are also encouraged to include key events that may have influenced any other non-teaching career goals that you have had in the past, or that you still have today. I encourage you to think back as far as you can remember when trying to recall events that influenced your career ideas, interests, and goals.

This activity is meant to help structure our conversation, and to get you thinking about and remembering your own career-related development and experiences. There is no “right” way to do this activity—your timeline will likely look very different from another participant, and that is okay! Some people may prefer to draw an actual timeline, while others may choose to approach this task completely differently. No artistic skill is required, and you may be as detailed as you would like in creating this document.

I have about 15 minutes allotted for this activity. If believe you are finished before that time, let me know and we can proceed with the interview. If you need more time, I can give you up to 25 minutes to complete the activity. If additional ideas come up throughout the course of the interview, you will be invited to add to it at any point. After the interview I will make a copy of the document so you will have a copy for yourself. You will also be given the opportunity to make any edits to the timeline, and/or your interview responses after the fact.

Appendix G

Interview Protocol

The questions below may be used during interviews with participants. Due to the nature of semi-structured interviewing, I anticipate probing further for any responses that may require additional detail.

Timelining Exercise Review and Key Experiences

1. Tell me about how the timelining exercise went for you.
2. Walk me through the major events that you included on your timeline.
 - a. (Allow for probes on specific events mentioned and the influence of these events on career choice)
3. Based on this exercise, about when do you think you first became interested in teaching?
4. Based on this exercise, what do you think are the most important experiences that led you to pursue a career in teaching?
5. Were there any people who were especially important to your interest in this career path?
6. What aspects about teaching have most motivated you to pursue this career path?

North Carolina Teaching Fellows Program Decisions

7. Where did you first hear about the NC Teaching Fellows program?
 - a. Who did this information come from?
 - b. When did you receive this information?
8. This version of the North Carolina Teaching Fellows Program is based on an original version of a similar, but larger, program that started in the 1980s and ended around 2011. Had you heard of older version of the program before you applied?
 - i. (If yes) What did you know about the old program?
 - ii. (If yes) Did the old version of the program influence your interest in applying to the new NC Teaching Fellows program?
9. What aspect(s) of the NC Teaching Fellows program did you find most important to your decision to apply?
10. What made you choose to attend (insert institution name)?
 - a. Were you deciding between any of the other five institutions that offer the NC Teaching Fellows program (Elon University, Meredith College, NC State, UNC-Charlotte and UNC-Chapel Hill)?
11. What role did the NC Teaching Fellows program have in your decision to pursue a career in teaching?
 - a. What role did the NC Teaching Fellows program have in your decision to teach in a STEM subject, specifically?
 - i. How important is the subject you teach to your plans to become a teacher?
 - b. Prior to entering the Teaching Fellows Program, had you considered pursuing other major(s)?
 - i. (If yes) What other major(s) do you think you may have been interested in?
 - ii. If you were not accepted to the NCTFP program, do you think you would have selected a different major?
 1. (If yes) What major(s)?
 - c. Prior to entering the Teaching Fellows Program, had you considered pursuing other careers?

- i. (If yes) What other career(s) do you think you may have been interested in?
 - ii. If you were not accepted to the NCTFP, do you think you would have selected a different career?
 1. (If yes) What careers?
12. How has your experience in your current degree program and in the NCTFP influenced your ideas about what it is like to be a teacher?

Future Ideas and Goals

13. What subject(s) and grade level(s) are you hoping to teach after completing your degree?
14. What type of school are you hoping to teach at after completing your degree?
 - a. Do you plan to teach in a low-performing school?
 - i. Why or why not?
 - ii. (If yes) Do you think you will be at this school for all four years of required service?
15. Are you planning to pay back all of the money that you are receiving through this program in teaching service?
 - a. How certain do you feel that you will complete all teaching service requirements to have your loans forgiven?
 - b. As of right now, do you believe you will continue in teaching beyond the required years of service to pay back the scholarship money received?
 - c. Do you have any concerns about paying back the funding you are receiving, either through teacher service, or in cash?
16. Do you have any concerns related to pursuing a career in teaching?
 - a. (If yes) What are the primary concerns that you have?
17. What are you most excited about in becoming a teacher?

18. Do you have any additional information you would like to share, but may not have gotten a chance to through the course of our conversation?

Appendix H

Education History/Background Survey

Did you attend high school in North Carolina?

- Yes
- No (if no, from what state): _____

Was your full high school education completed in North Carolina?

- Yes
- No (if no, from what state[s]): _____

Did you attend a public or a private high school?

- Public
- Private
- Both (please explain): _____
- Neither (please explain): _____

In what city or town did you attend high school? _____

How old are you? _____

What was the highest level of education completed by your mother (or other parent/guardian 1)?

- Did not complete high school
- High School or GED
- Some College
- Associate's Degree
- Bachelor's Degree
- Graduate or professional degree (Master's, JD, PhD, etc.)
- Not sure
- Other: _____

What was the highest level of education completed by your father (or other parent/guardian 2)?

- Did not complete high school
- High School or GED
- Some College
- Associate's Degree
- Bachelor's Degree
- Graduate or professional degree (Master's, JD, PhD, etc.)
- Not sure
- Other: _____

Have any of your parents or guardians worked as K-12 teachers?

- Yes, more than one of my parents/guardians have worked as teachers
- Yes, one of my parents/guardians has worked as a teacher
- No
- Not sure

What do you estimate was your family's annual household income while you were in high school?

- Less than \$25,000
- \$25,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000 or more
- Not sure
- Prefer not to respond

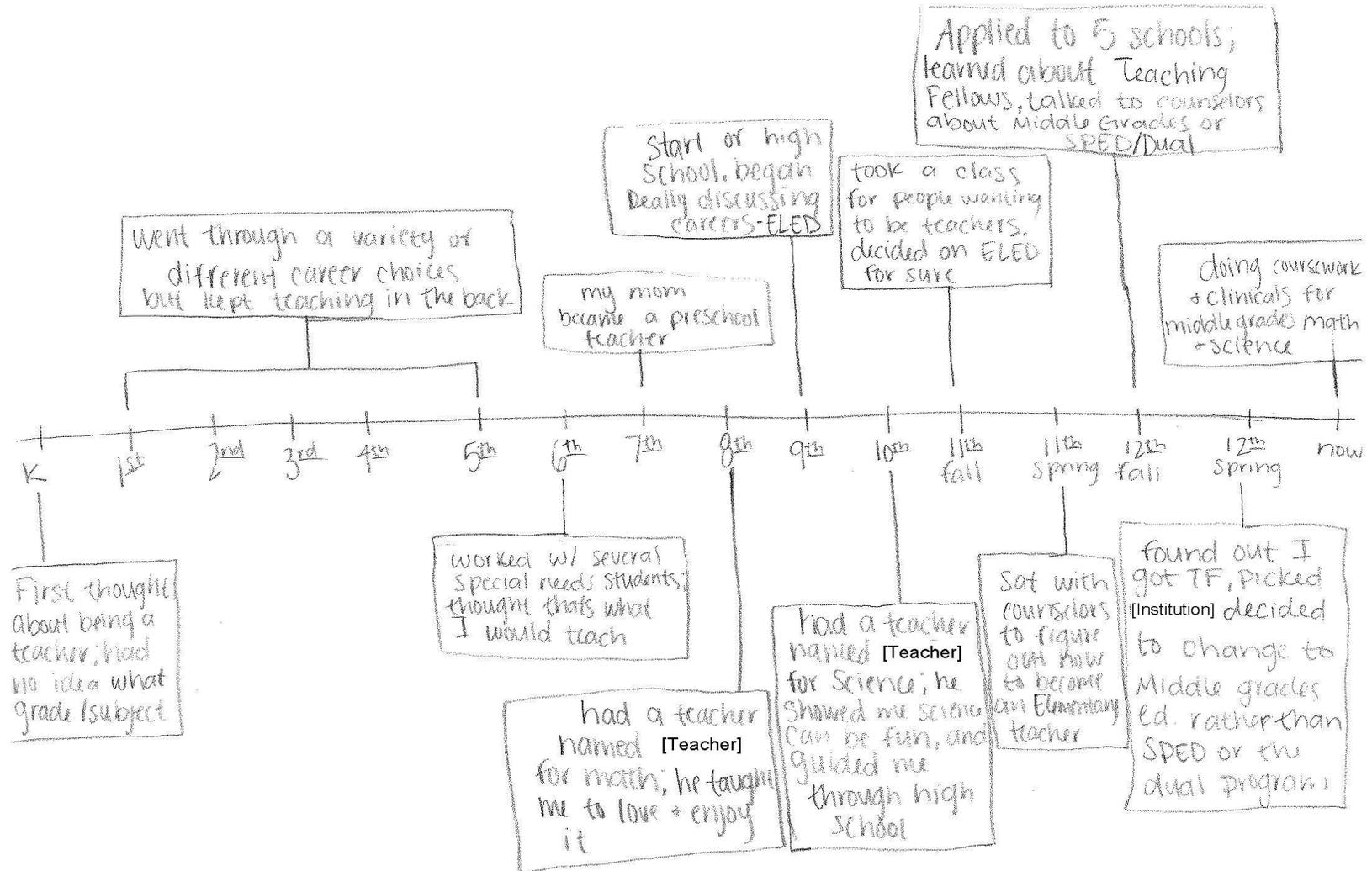
To protect your confidentiality in the study, you will be represented by a pseudonym. If you have a pseudonym that you would like for me to use to represent you, please include that name here:

Appendix I
Participant Timelines

Monica's Timeline

- played teacher growing up
- * Going into high school wanted to be English major absolutely loved writing
 - * what will I do with an english degree?
Grandpa English professor - wanted to be English teacher
 - * thought about law school also because of Grandpa
↳ read article saying admissions liked teachers
 - * had really good sophomore english teacher
- always loved science
- * had great high school science teacher
- helped my autistic brother made me want to be special needs

Victoria's Timeline



Taylor's Timeline

2nd grade - staying after school w/ my mom
helping other teachers

3rd grade - loved my teacher
playing school

5th grade - good year in general, + thoughts about school

6th grade - terrified b/c all male teachers
[Teacher Name]

7th/8th grade - mix of teachers
really good at math

9th - loved band, wanted to go into music ed

10th - bad teachers

11th - started showing interest and asking
about math and music ed
babysitting, tutoring

12th - applying to [NCTFP and private Teaching Fellows program]
no to music

freshman - helping others w/ math
calc &
pinterest

Christy's Timeline

Timeline

Elementary School - 2005-2011

- K - attended private school focused in STEM
 - regular field trips to Discovery Place in Charlotte, NC
- 2nd-3rd - join the technology club at school where we learned about computers and how technology works around us.
- 5th grade - apart of the student news & plays

Middle School - 2011 - 2014

- The middle school that I attended was a Magnet STEM school.
- 8th grade - apart of a peer-tutoring group to help other students in math & reading

High School - 2015 - 2018

- 9th: Apart of the academy of information technology all four years
 - Became ^{NAF} certified in multiple platforms including word, powerpoint, excel, web design, & video production

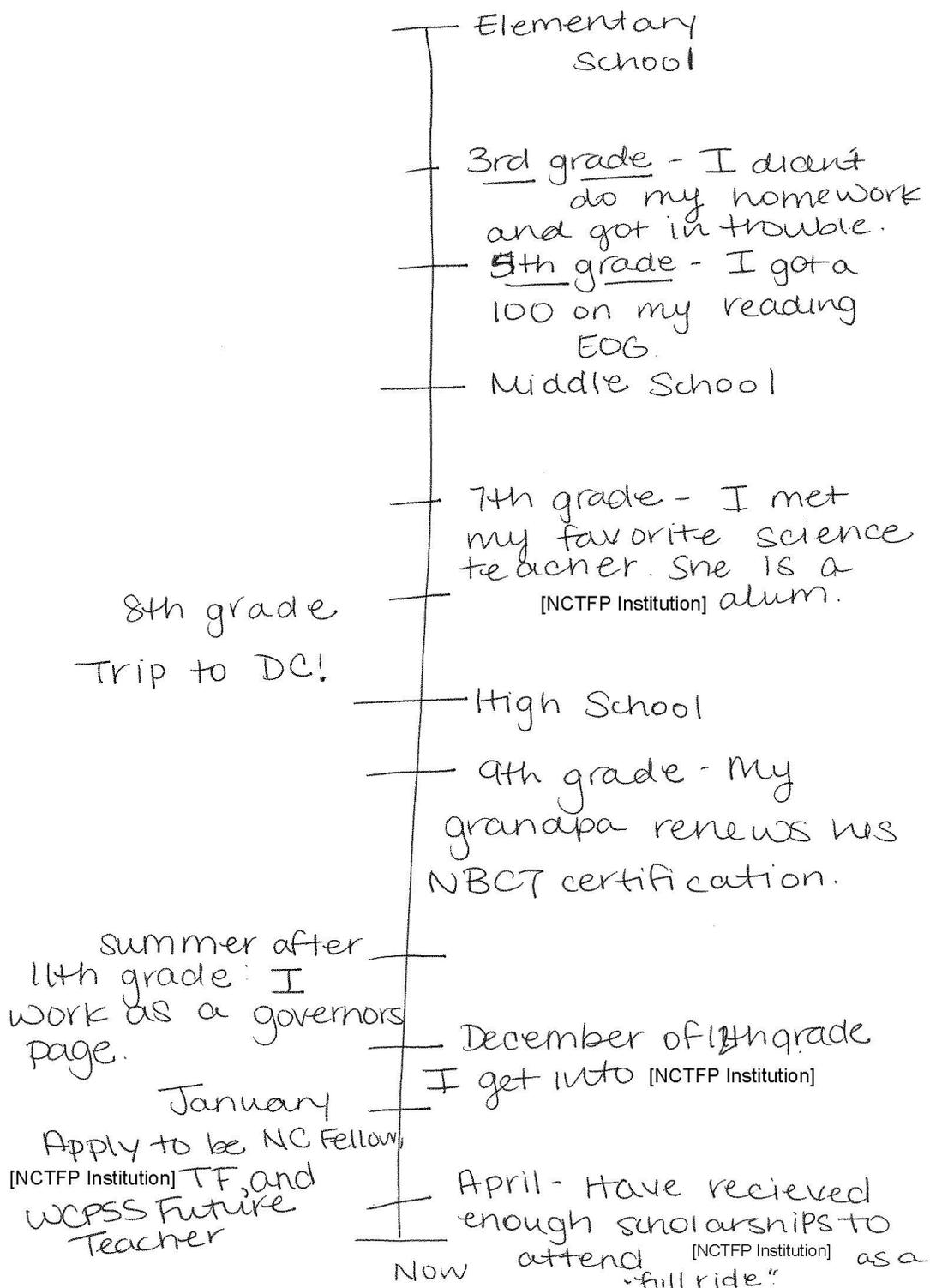
10th: Varsity Cheer, IT

11th: Varsity cheer captain, student tutoring, studied abroad in Mexico to learn about other cultures, Student council

12th: Internship at the Diocese of [city] for web design & video production, Varsity cheer captain, Student council, Served as a page for the NC House.

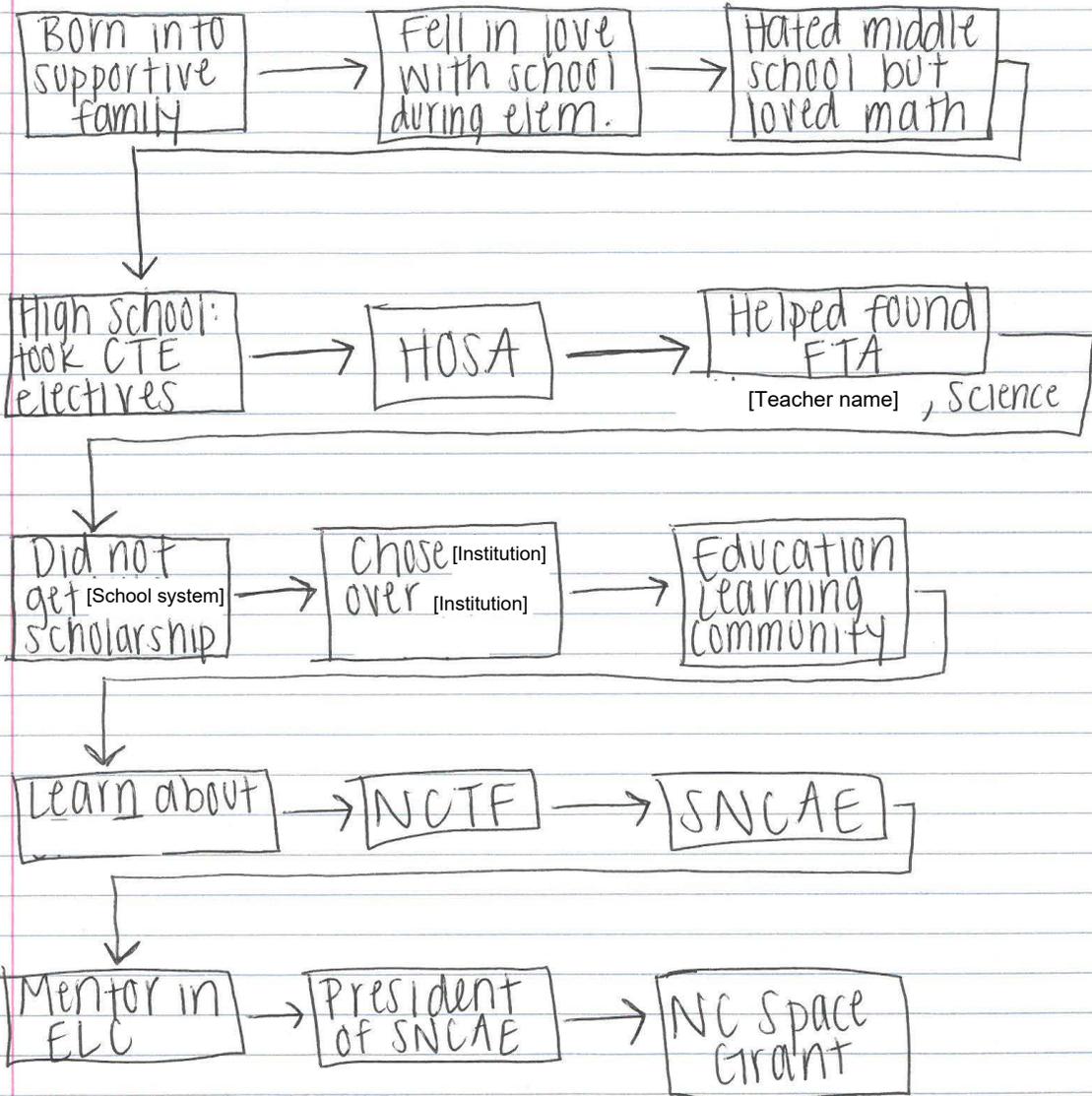
College: Became a teaching Fellow at [Institution]

Zoe's Timeline

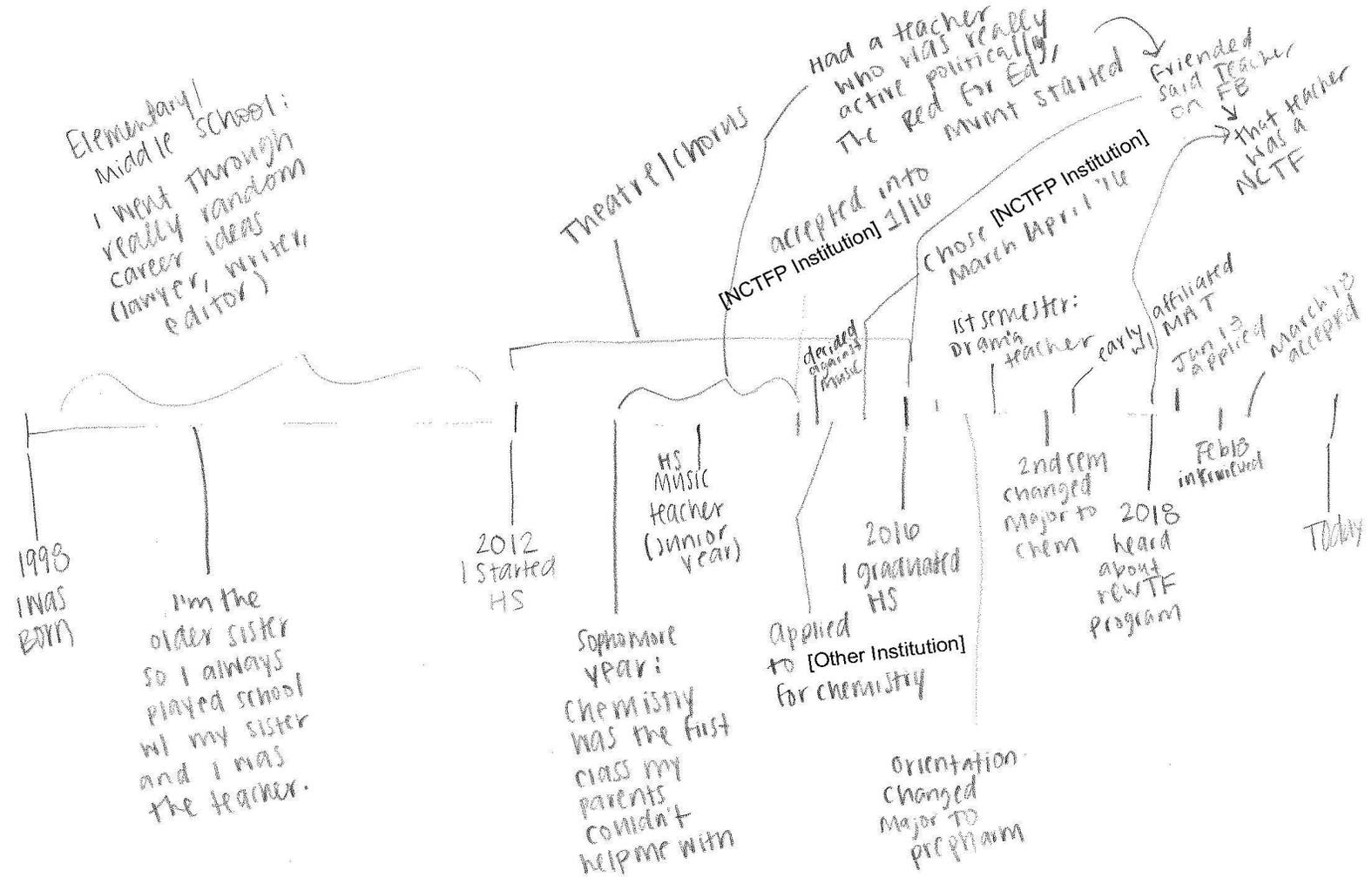


Jenna's Timeline

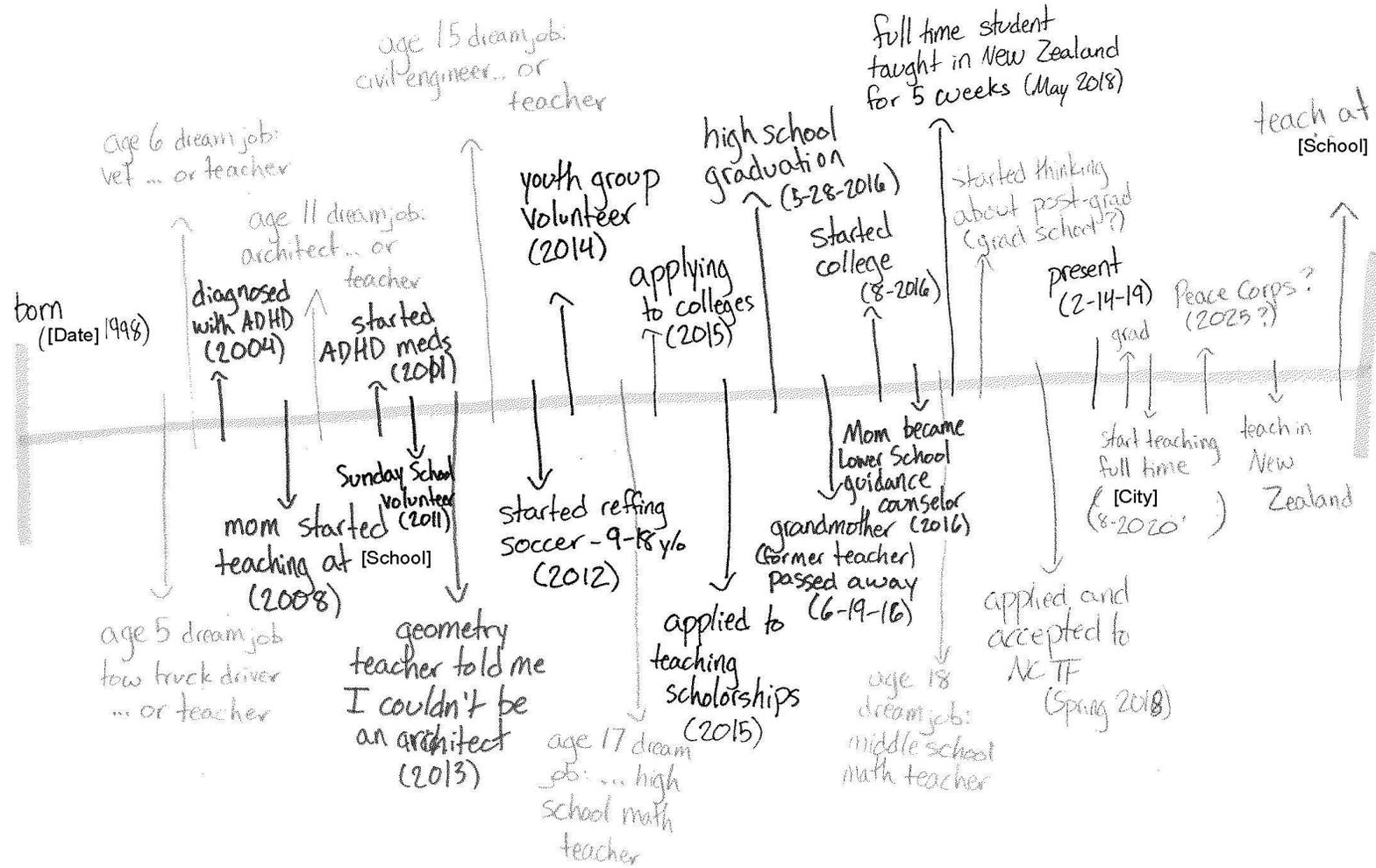
Timeline Activity



Matilda's Timeline



Kristen's Timeline



Kyle's Timeline

- Started High school
 - Took Engineering class
- Moved high schools
- Got into [Institution]
 - Engineering talent
- Joined A Fraternity
 - Met a Good friend who's a teacher
- Took Physics + Calc 2 and Calc 120
 - Dropped Calc Failed Physics
 - Talked to professor + Good friend
- Switched majors to TDE licensure
- Applied for teaching fellows
- Got accepted
- Work at [School] middle

Felicity's Timeline

- 2000-2001: At the age of 4, I attended a preschool in SC (NC was selective on who attended preschool due to limited number of seats, and I passed the test given which made me ineligible). When I would come home, I would force my sister to listen to all of the things I had learned. The next year, my sister also passed the preschool test.
- 2001-2007: Throughout elementary school, I would play teacher almost every afternoon. I would force my little sister and stuffed animals to read books and take tests.
- 2007-2010: In middle school, my interest changed. I became quite obsessed with NASA and the space program after a 6th grade field trip to the Kennedy Space Center, and I considered a career of being an astronaut.
- 2009-2010: In 8th grade, I took Algebra 1 at my middle school. I asked a lot of questions, and my teacher was surprised when I passed the EOC [end-of-course exam].
- 2009-2010: A middle school teacher talked about how awesome she taught the Teaching Fellows program was, and I knew paying for college would be hard, so it was something that I became interested in.
- 2010-2014: In high school, I realized my love for math. I excelled at every math course I took.
- 2011: I was pretty upset when I heard that the Teaching Fellows program had been discontinued. My chances of going to college seemed slim.
- 2012: During my junior year, I took Pre-Calculus with Mrs. [name]. She had a reputation of being the hardest teacher at our school, she was close to retirement, and she rarely gave As. I finished her class with a 98%, and it solidified my ability and passion for math.
- 2013-2014: During my senior year, when trying to decide a major, it seemed easiest to combine the two things I enjoyed, teaching and math.
- March 2014: I received a full ride to [institution] (this scholarship made choosing which college to go to very easy).
- May 2014: I passed the AP Calculus AB test.
- August 2014: Started college at [institution]. My first math course (and first class as a college student) was Calculus II, which was filled with juniors and seniors.
- September 2014: I took a job as a tutor for the Math Department. It was an open tutoring time, and I was tutoring courses from College Algebra-Calculus II.
- 2014-2015: I received a lot of comments from math professors who wanted me to change my course of study from math education to just math. They believed that my mathematical ability would be better suited for a career in engineering.
- 2014-2015: At the same time, I was taking American Indian Studies courses, and I quickly realized I had a huge interest in the subject.
- May 2015: I changed my major from Math Education to a double major in Mathematics and American Indian Studies (I wanted to keep all my options open).
- 2015-2016: I started to explore career options in the field of American Indian Studies. I also volunteered in the university's museum.
- May 2016: My academic advisor moved universities, so we had a final meeting to discuss my course schedule for my final two years. During this meeting, we discovered that I would be graduating a semester early.

- 2016 Fall Semester: I took a Mathematical Physics course (essential applied Calculus 2). My professor attempted to try to get me to change my major to physics.
- 2016 Fall Semester: I had a lot of soul searching to try to decide what I wanted to do after graduation.
- 2017 Spring Semester: I took a internship with my previous physics professor through NASA to see if it was something that I was interested in (reliving my desire to be an astronaut).
- 2017 Spring Semester: After a conversation with a math professor about continual tutoring for the math department, I decided that I did want to be a teacher.
- 2017 Spring Semester: Began researching teacher licensure programs, and I decided that an MAT was the best decision for me.
- Summer 2017: Continued researching schools and programs, passed the Praxis Secondary Mathematics Content Knowledge test.
- Fall 2017: Narrowed down the schools to [NCTFP institution], [institution], and [institution] (all 1 year intensive MAT programs)
- September 2017: Heard a rumor that the NC Teaching Fellows was returning, so I started doing some research.
- November 2017: Completed and submitted application to [institution]
- December 2017: Completed, submitted application, and accepted to [institution]
- December 2017: Clocked out of my last tutoring session after logging over 800 hours in 3.5 years.
- December 2017: I graduated from [institution] with honors and BS in Mathematics and BA in American Indian Studies.
- December 2017: Completed and submitted application to NC Teaching Fellows
- Spring 2018: Growing interest in curriculum, considering maybe furthering my education with a degree in Curriculum & Instruction
- January 2018: Completed and submitted application to [institution]
- February 2018: Accepted to [institution]
- March 2018: Completed [NCTFP institution] interview
- March 2018: Completed NC Teaching Fellows Semi-finalist interview
- March 2018: Accepted to [NCTFP institution]
- March 2018: Accepted to the NC Teaching Fellows
- March 2018: Accepted offer to attend [NCTFP institution]
- June 2018: Started Summer courses at [NCTFP institution]
- August 2018: Started year-long student teaching at [name] High School (2 days in the fall, full time in the spring)
- December 2018: Signed an early contract with [System] County Schools

Appendix J

Second Interview Protocol

1. Is there anything that has come up for you that I should know that we did not get a chance to discuss last time?
2. Did you get a chance to review the narrative?
 - a. (If yes) How did you feel that the narrative represented your story?
 - b. (If yes) Was there anything you would like to change?
 - c. (If yes) Do you have any questions or concerns or requests about your confidentiality within the study?
3. Now that I've talked to all 10 participants, there were a couple things that made your story especially unique and that I wanted to ask several clarifying questions about:
 - a. (Tailor to participant)
4. Throughout conversations, it was common for students to express uncertainty about some components of NCTFP teaching service requirements. Was there anything about the post-graduate requirements that you found confusing?
 - a. (Mention specifics from the participant's narrative)
 - b. Do you know how the program defines low-performing?
 - i. Across conversations, students commonly used a term like "low-income" instead of "low-performing." Why do you think that may have been the case?
5. What do you think could be improved about the Teaching Fellows program, as it is now?
6. (Confirm categorization of experiences in Table 5.3.)
7. (Presentation major themes that relate to the participant's narrative fits into each. Ask for feedback on these categorizations.)
8. Are there any final thoughts you would like to share about your experience that you haven't had the chance to do so yet, or that you think I may have missed?
9. Would you be open to me contacting you in the future, one year at the earliest but perhaps as many as 5 years out, to ask about the decisions you made related to your career after college?

Appendix K

Table A2

Optional Supplementary Materials Submitted

Pseudonym	Description of supplementary materials submitted, where applicable
Christy	NCTFP application short essay drafts
Jenna	Application for teacher support program, application for extracurricular leadership opportunity for education majors, two short reflection papers on NCTFP experience;
Matilda	High school civics paper written about personal finance goals
Kyle	Link to personal website

Note. The remaining six participants did not submit optional supplementary documents

Appendix L

Protocol for NCTFP Campus Coordinator Interviews

1. I'd love to hear a little bit more about your work and role(s) with the NCTFP:
 - a. How long have you been working with the program?
 - b. Did you have any interaction with, or knowledge of, the former NCTFP?
 - c. About what percentage of your job does work related to this program consume?
 - d. Who are the main partners/stakeholders on your campus?
2. My impression is that the NCTFP offers pretty minimal guidance to partner institutions in terms of the structure type of activities that should be offered to support Fellows' professional development. What types of activities does your institution offer the Fellows right now?
 - a. How do you envision this changing as the program continues to grow and develop?
3. How many Fellows are there currently at your institution?
 - a. Is there a cap on the number of Fellows your campus can have?
4. What is the distribution of your Fellows between those planning on Special Education and STEM fields?
5. What is the distribution of your Fellows by class year?
6. One of the challenges of the first year of the program was its late start and I know that a number of factors both influenced and limited the makeup of the first year class. What are the gender and racial characteristics of the first group of Fellows at your institution?
7. How do you anticipate the NCTFP changing next year, on your campus?
 - a. Do you have any specific goals?
8. I imagine you've been spending time recruiting for next year's cohort of Fellows. How is that recruiting process structured for your campus?
 - a. Do you have a strategy for recruiting?
 - b. Are there any specific challenges that you've encountered in recruiting?
 - c. Are there any trends you're seeing in the questions people ask?
 - d. Who do you consider your target audience to be?
 - i. High school students?
 - ii. Students already interested in teaching?
9. What do you feel are the biggest strengths of the program in its current format?
10. How do you think the program as a whole could be improved?
11. Do you anticipate the program changing?
12. Is there anything else you would like to share about your work with the NCTFP?

Appendix M

Table A3

Primary Source of Information for Learning About the New NCTFP

Pseudonym	Class Year	Source for Learning about the NCTFP
Monica	First-Year	High school guidance counselor
Victoria	First-Year	High school teachers
Taylor	First-Year	Private Teaching Fellows program leader at prospective institution (open house event)
Christy	First-Year	Mother (former NCTFP participant)
Zoe	First-Year	Website: College Foundation of North Carolina
Jenna	Sophomore	Email to education students at institution
Matilda	Junior	Facebook
Kristen	Junior	Private Teaching Fellows program leader (cohort meeting)
Kyle	Junior	Email to education students at institution
Felicity	Master's Student	College professor