

## ABSTRACT

GRIFFIN, WHITNEY BETH. Effects of a Brief Psychoeducational Intervention on Peers' Cognitions, Emotional Reactions, and Behavioral Intentions towards Students with ASD (Under the direction of Dr. Scott Stage).

This quasi-experimental study investigated the effects of a brief psychoeducational intervention on 272 middle school participants' behavioral intentions, cognitive attributions, and emotional reactions towards a target student displaying characteristics of moderate to severe autism spectrum disorder (ASD) or as compared to high functioning ASD or a typically developing control, each depicted in a separate video vignette. One intervention specifically targeted ASD, and a comparison intervention involved a broad-based character education lesson. Results of a doubly repeated multivariate analysis of variance indicated that participants' ratings across measures, video condition, and time were significantly different, though the effects of time were small. Overall, participants reported a higher willingness to interact with the typically developing student and the student with more severe ASD as compared to the student with high functioning ASD. Participants reported higher ratings of cognitive attributions (i.e., statements of blame/responsibility for behavior), higher ratings on an anger scale, and lower ratings of sympathy towards the student with high functioning ASD as compared to the student with moderate to severe ASD. No effects involving lesson and time were observed, suggesting that the intervention specifically targeting ASD was not uniquely effective. A follow-up regression analysis to test for mediation partially supported the theory that cognitive attributions are negatively associated with behavioral intentions and mediated by emotional reactions, but only for participants' ratings of the student with high functioning ASD. The discussion focuses on differences in peers' views towards students with high functioning ASD and implications for practitioners in supporting these students.

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Effects of a Brief Psychoeducational Intervention on Peers' Cognitions, Emotional Reactions,  
and Behavioral Intentions towards Students with ASD

by  
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## **DEDICATION**

To my brother, Alex, whose middle school experiences inspired me to explore ways to support students with ASD and to better understand how to prevent the bullying and isolation that so many individuals with ASD face, particularly in their adolescent years.

## **BIOGRAPHY**

Whitney Beth Griffin is a North Carolina native who is currently a graduate student in the school psychology program at NC State University. Prior to entering the program at NCSU, she worked as a teacher and autism specialist for Orange County Schools. Whitney pursued her bachelor's degree in deaf education with a concentration in psychology from the University of North Carolina at Greensboro in 1999, where she was a North Carolina Teaching Fellow and an Ethel Virginia Butler scholarship recipient. She earned her master's degree in special education from East Carolina University in 2010, specializing in low incidence disabilities. Whitney served on the Board of Directors for the Autism Society of North Carolina for two terms. She is currently completing an internship at the Psychoeducational Clinic at NC State University in Raleigh, a charter school in Durham, and the Carolina Institute for Developmental Disabilities in Chapel Hill.

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Leaving one career to return to school and pursue another has been a challenging, exciting, and stressful endeavor (and that was even before I had a baby!), and I am incredibly grateful to my family for their ongoing support and encouragement throughout this time. Finally, to my husband, Eric – I know at times you feel like you’ve gone back to school along with me! Even though that’s not quite what you signed up for, I’m so glad you joined me on this adventure and have hung in there with me to the end. I love you.

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## **EFFECTS OF A BRIEF PSYCHOEDUCATIONAL INTERVENTION ON PEERS' COGNITIONS, EMOTIONAL REACTIONS, AND BEHAVIORAL INTENTIONS TOWARDS STUDENTS WITH ASD**

Students with autism spectrum disorder (ASD) experience substantial social communication challenges. Areas of difficulty include deficits in social-emotional reciprocity, limited skills related to nonverbal communication, and difficulties developing, maintaining, and understanding relationships (American Psychiatric Association [APA], 2013). These deficits have negative implications for the way students with ASD perceive and interact with others as well as the perception and views of others towards students with ASD. In addition, the restricted and repetitive behaviors and interests exhibited by individuals with ASD have the potential to further impede their relationships with peers. Carter et al. (2014) describe adolescence as a particularly challenging time for individuals with ASD due to the increasing emphasis and complexity of peer relationships for students at that age. Thus, finding ways to support the social inclusion of adolescents with ASD is an important and challenging task.

### **Social Interaction between Individuals with ASD and Peers**

The interactive experiences between individuals with ASD can be better understood through research regarding social networks and research related to bullying and victimization. Locke, Ishijima, Kasari, and London (2010) investigated the social networks and friendship quality of high school students with ASD and their typically developing peers and found that students with ASD reported significantly more loneliness. Even though students with ASD were able to identify a best friend, they demonstrated significantly poorer friendship quality related to factors of companionship and helpfulness. Students with ASD were also more isolated or peripheral in the social network with significant lower social network ratings and less

connections. Jones and Frederickson (2010) found that primary and secondary school classmates were less willing to work with students with ASD as compared to typically developing peers.

Students with ASD were also more frequently rejected and less well accepted by peers.

Students with ASD have also been observed to experience higher rates of bullying victimization as compared to typically developing peers (Sterzing, Shattuck, Narendorf, Wagner, & Cooper, 2012) as well as students with dyslexia (Symes & Humphrey, 2010) and students with intellectual disabilities (Zeedyk, Rodriguez, Tipton, Baker, & Blacher, 2014). In addition, factors such as social vulnerability, social skills, skills related to theory of mind (i.e., recognizing/attributing mental states to oneself and others), and quantity and quality of friendships have been found to be associated with or predict bullying experiences (Cappadocia, Weiss, and Pepler, 2012; Sofronoff, Dark, & Stone, 2011; van Roekel, Scholte, & Didden, 2010). It seems the unique deficits in social and emotional functioning of students with ASD are associated with problematic social interactions with peers.

### **Addressing the Autism Spectrum**

Autism is considered a spectrum disorder because characteristics and deficits of individuals with ASD fall along a continuum. For example, social skills can range from withdrawn to socially awkward, and communication skills can range from being nonverbal to having a large vocabulary but difficulty understanding pragmatic language and interpreting the nuance of social interaction. Individuals who are less impaired by their social communication and behavioral deficits are typically considered to be high functioning (APA, 2013).

Researchers do not always make an effort to distinguish between individuals with high functioning ASD and individuals presenting with more moderate to severe characteristics, but differences may exist related to outcomes. For example, Zablotzky, Bradshaw, Anderson, and

Law (2014) found that students with a higher functioning form of ASD, formerly known as Asperger's Disorder, were more likely to be victimized than students diagnosed with autistic disorder; however, students rated as having a high or moderate level of autistic traits were also more likely to be victimized overall. Rowley et al. (2012) found that lower social and communication impairment was associated with more meaningful friendships but also resulted in a higher likelihood of victimization for students with ASD in mainstream settings.

### **A Model Linking Peer Interaction Patterns and Social Outcomes**

Based on the literature regarding patterns of social interaction between students with ASD and their typically developing peers and social outcomes for students with ASD, Humphrey and Symes (2011) developed the *reciprocal effects peer interaction model* (REPIM). The authors conceptualize this model as “a theoretical framework to develop our understanding of how the various social outcomes that are widely reported for included students with ASD originate and relate to one another” (Humphrey & Symes, 2011, p. 399). The authors posit that the social cognition deficits of students with ASD impact their social and communication skills; this lack of skills leads to reduced quality and frequency of peer interaction and results in limited social networks and less social support. This lack of peer support leads to increased bullying and social rejection, and ultimately increased isolation and loneliness for students with ASD. These students are then less motivated for contact and tend to engage in more solitary behavior, which impacts further development of social and communication skills and perpetuates the cycle. At the peer level, lack of awareness and understanding about ASD leads to reduced acceptance of differences, and the continued limited interactions with students with ASD reduce opportunities to learn about ASD and perpetuate the cycle further.

Humphrey and Symes (2011) investigated features of this model in a study in which they observed and coded behaviors of secondary students with ASD, students with dyslexia, and typically developing students in their social interactions with peers. Researchers observed that students with ASD engaged in significantly more solitary activities for significantly longer time periods and spent significantly less time in cooperative interactions than the other observed groups. Students with ASD were more likely to engage in reactive verbal aggression, and they were less likely to engage in rough or vigorous play. Peers were more likely to initiate social interactions with students with ASD, but they were also more likely to use instrumental verbal aggression towards students with ASD. Overall, the authors interpreted the findings as supportive of their theoretical model. However, the directionality of some of these effects was not examined, so it is possible that bidirectional influences would make it challenging to determine a particular order of certain steps in the process. For example, poor social skills might lead directly to negative interactions and bullying from peers, which could impact the social network status of a child, thereby leading to less development of friendships and increased risk for more bullying. Limitations in the direct observation methodology used in this study also create a risk of the Hawthorne effect (i.e., participants may have behaved differently because they knew they were being observed), which tempers interpretation and generalizability of results. Nonetheless, this model appears to include key features of a cycle of impaired social competence, poor interactions, and limited social support that could uniquely impact social outcomes for students with ASD. However, a substantial limitation in this study is the focus on students with ASD and not their peers. When considering the interaction model proposed by Humphrey and Symes, it seems that a valuable aspect of understanding social difficulties of students with ASD is the role of peers in this negative cycle of social interactions. It would be

particularly useful to identify how educators might intervene at the peer level to change this pattern, such as designing classroom lessons to promote acceptance of students with ASD.

### **Peer Attitudes**

One factor that may impact the role of peers in the successful social integration of students with ASD is peer attitudes towards students with ASD. Research regarding attitudes has addressed affective, behavioral, and cognitive components of attitudes. The affective dimension of attitudes relates to peer's feelings towards a person with ASD, the cognitive component is usually conceptualized as statements of belief about the person, and the behavioral component involves behavioral intentions, or willingness to interact with that person (see Campbell, 2006).

Several researchers have investigated the attitudes of typically developing individuals towards students with ASD. Campbell, Ferguson, Herzinger, Jackson, and Marino (2004) and Swaim and Morgan (2001) observed peers demonstrated more negative cognitive attitudes towards a student with ASD as compared to a typically developing student. Campbell et al (2004) also found that peers indicated poorer behavioral intentions toward a student with ASD. Griffin (2016) investigated peers' behavioral intentions towards a child depicting characteristics of high functioning ASD as compared to a child with moderate to severe characteristics of ASD or a typically developing control. She found that peers demonstrated the poorest behavioral intentions towards the child displaying signs of high functioning ASD; however, no differences were observed in behavioral intentions towards the student with moderate to severe ASD and the typically developing control.

One factor that may contribute to peer attitudes is prior contact with individuals with ASD. Gardiner and Iarocci (2014) found that greater contact quality was associated with higher

levels of acceptance of individuals with ASD in a study involving undergraduate students. Similarly, Nevill and White (2011) observed that undergraduate participants who reported having a first-degree relative with ASD demonstrated more positive attitudes towards a person with ASD in a written vignette. In contrast to these studies, Griffin (2016) did not find that prior knowledge of ASD was associated with middle school participants' behavioral intentions towards a student with ASD; however, the use of a dichotomous variable (i.e., a *yes* or *no* response to the question, "Do you know someone with autism?") limited the potential variability of contact as a measured variable in this study.

Freitag and Dunsmuir (2015) investigated several factors related to peer attitudes and perceptions of students with ASD. One interesting finding was that reported behavioral intentions related to a hypothetical classmate with ASD were predictive of actual interactions with classmates with ASD based on a socio-metric roster method. Thus, measures of behavioral intentions may be relevant for understanding potential social interactions among students with ASD and their peers.

**Affect-cognition-behavior: A theoretical pathway.** Early research involving affect, cognition, and behavior explored these constructs in relation to attribution theory. Attribution theory posits that people's emotional reactions and motivation to act in situations is based on their need to explain the causes of events. When people perceive that an individual does or does not have control over his or her behavior, this perception affects their resulting attitudes and behavioral responses toward that individual. That is, cognitions impact feelings, which in turn impact behavioral intentions. For example, Schmidt and Weiner (1988) found that even when attempting to manipulate the focus of participants (*self-focus* versus *other/empathy focus* versus *objective focus*), participants still followed the same pattern. That is, when participants perceived

that the target individual had control over the situation (as compared to no control), they demonstrated an emotional reaction of anger (rather than pity), which led to unwillingness to help (instead of helping behavior). The scenario investigated in this study involved a fellow student needing notes from class for various reasons.

Weiner, Perry, and Magnusson (1988) explored this same cognition-affect-behavior pathway in the context of various conditions considered to be socially stigmatizing at the time, including conditions such as blindness, cancer, drug addiction, heart disease, obesity, and paraplegia. In the first study, the researchers observed that overall, participants perceived most of the stigmas with a more mental-behavioral basis as more controllable. They provided higher ratings of anger and lower pity and indicated less help-related behavioral responses. In a second study, the researchers manipulated participant cognitions about the conditions by providing information that either suggested the onset of the condition was controllable or the onset was uncontrollable. Results suggest that when participants were given information that the condition was controllable, they demonstrated more anger and blame and less pity and helpful behavioral responses.

In a more recent series of studies, Stump, LaPergola, Cross, and Else-Quest (2016) used a manipulation of onset controllability in three different health conditions – HIV, lung cancer, and anorexia – to explore cognitive attributions, emotional reactions, and behavioral intentions of participants. Researchers found that emotional reactions partially or fully mediated the effects of cognitive attributions on participants' behavioral intentions across health conditions.

Additionally, when onset controllability was manipulated by providing information that suggested the participant engaged in behavior that may have led to the condition, participants demonstrated a difference in cognitive attributions, emotional reactions, and behavioral

intentions in the two relevant health conditions (HIV and lung cancer), lending further support for attribution theory. That is, when participants believed a person engaged in behaviors such as risky sexual behavior or smoking, they found the person to be responsible for the associated condition, demonstrated more anger, and reported less willingness to help that person.

Rudolph, Roesch, Greitemeyer, and Weiner (2004) specifically explored this cognition, emotion, and behavior pathway in a meta-analysis addressing anger, sympathy, aggression/hostile responses, and help-giving responses. Results lend additional support for the model of cognitions regarding perceived controllability and responsibility for a situation or condition leading to behavioral intentions of help-giving or aggression and mediated by affective responses of sympathy or anger.

Several researchers have applied this construct of attribution theory to understanding people's attitudes and behaviors towards individuals with disabilities. This theory leads researchers to predict that when peers believe that a person's behaviors are related to a disability and thus not under that person's intentional control, those peers will have more sympathy and be more willing to provide social support to that person (Campbell et al., 2004; Swaim & Morgan, 2001). The figure below, adapted from the work of Corrigan (2000) and Weiner et al. (1988), illustrates this concept (see Figure 1):

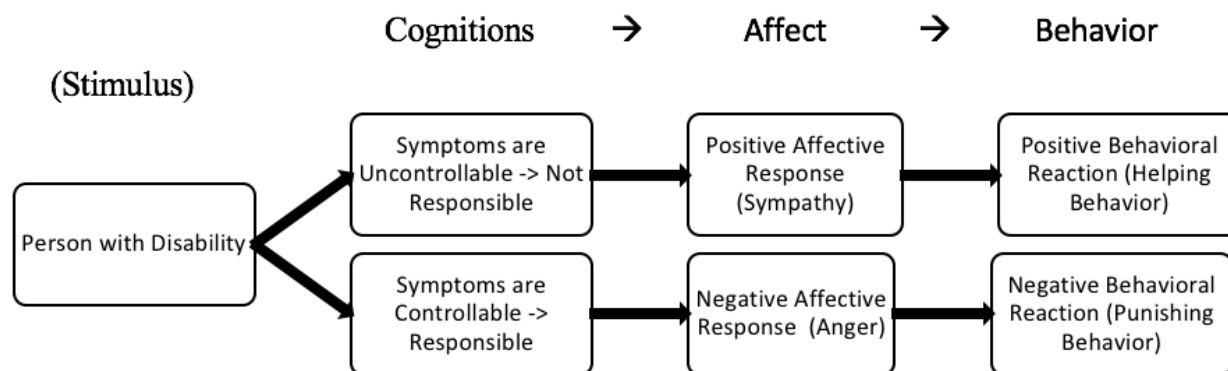


Figure 1. Perceptions of people with disabilities: Cognition, affect, and behavior.

**Changing Attitudes.** Several studies have been designed to investigate whether awareness and understanding of ASD changes people's attitudes and interactions. Some studies have involved specific disclosure of ASD to participants. Chambres, Auxiette, Vansingle, and Gil (2008) found that adults demonstrated more tolerance and provided less severe ratings of the observed behaviors of a target child with ASD when they were informed that the child had ASD. Matthews, Ly, and Goldberg (2015) investigated college students' attitudes towards a student displaying characteristics of high functioning ASD depicted in a written vignette. When the label of ASD was included, participants demonstrated more positive behavioral and cognitive attitudes (but not affective attitudes) towards the target student. Sex differences were also observed, with males demonstrating more positive affective, cognitive, and behavioral attitudes than females. In a qualitative study by Ochs, Kremeer-Sadlik, Solomon, and Sirota (2001), the authors concluded that more positive inclusion occurred when a child's ASD was disclosed to peers. The researchers observed that students with ASD appeared to have more positive experiences and interacted with a wider range of students when their disability was disclosed as compared to students with ASD whose disability had not been disclosed to peers. However, the small sample size and design limitations inhibit the ability to make broader conclusions about this particular study.

Several studies have specifically investigated whether or not providing information about ASD will change peers' attitudes and willingness to interact with a target student with ASD. Peer training about ASD is relevant in the model of interaction proposed by Humphrey and Symes (2011), which posits that peers' lack of awareness and understanding about ASD is a contributing factor in the negative interaction cycles experienced by students with ASD; peer training may also be relevant to attribution theory because it may help peers understand that

having ASD is not something that individuals with ASD can control. Swaim and Morgan (2001) investigated peer attitudes towards a target student in a videotaped vignette under two video conditions – one in which the target child appeared to be typically developing and one in which the target child displayed classic characteristics of ASD. Both third grade and sixth grade participants demonstrated poorer attitudes towards the child with ASD overall. Only sixth graders reported significantly poorer behavioral intentions toward the child with ASD as compared to the typically developing control. Providing information about ASD did not result in significantly different ratings of attitudes or behavioral intentions for either age group. In contrast, Campbell et al. (2004) found that providing a combination of descriptive information (information that highlights similarities between the child with ASD and typical peers) and explanatory information (information that includes medical and causal information about ASD) was associated with significantly higher ratings of behavioral intentions towards the target child with ASD in a video vignette across 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade participants. Sex differences were also observed related to activities falling within the social and academic domain. Males provided higher ratings of behavioral intentions (that is, more willingness to engage in stated activities) than females for the typically developing target child, but males and females gave similar ratings towards the child with ASD in the social domain (i.e., activities involving primarily social contact, such as sharing materials, sitting together at lunch, or asking a person to join a friend group). In the academic domain (which involves educational and school-related activities such as working on projects or classroom assignments with the target student), females were more responsive than males to the combined descriptive and explanatory information provided about ASD. That is, a larger difference was observed in the attitudes of females when they received this combined information about ASD as compared to those females who were not given this

information; for males, this difference was not observed. Campbell (2007) examined the attitudes of middle school students towards a target child with ASD in a video and found that combined descriptive and explanatory information resulted in increased perceived similarity between the participants and the target child with ASD in the video; this perceived similarity then correlated with behavioral intentions. However, perceived responsibility and knowledge gain about ASD did not correlate with attitudes. Sex differences were also observed in this sample, with females reporting higher behavioral intentions than males overall.

Staniland and Byrne (2013) conducted a 6-session anti-stigma program at an all-boys middle school that included descriptive, explanatory, and directive information about ASD. The intervention group demonstrated significantly more knowledge about ASD and positive cognitive attitudes at post-intervention and follow-up, whereas students in the non-intervention control group did not demonstrate significant changes in knowledge or cognitive attitudes over time. However, no difference was observed in behavioral intentions for either group. In a follow-up study with middle school-age female participants, Ranson and Byrne (2014) found significantly improved attitudes for the intervention group and some spill-over effects with peers (i.e., changes in attitudes of peers in the same grade level who were not a part of the intervention) as compared to a non-intervention, non-peer group. Significant differences in behavioral intentions of participants in the intervention condition were also observed at post-test, but gains did not maintain at follow-up the next term.

The Organization for Autism Research ([OAR], 2012) has published a peer education program, *Kit for Kids* (KfK), which was created for upper elementary and middle school students. An initial investigation of these materials by Campbell (2016) suggests that KfK was appealing to upper elementary and middle school-age students and led to improved

understanding about ASD. In addition, initially more positive attitudes (using a combined measure of affective, cognitive, and behavioral attitudes) and self-efficacy regarding interaction with a target child in a video displaying characteristics of ASD was observed. However, at a follow-up one week later, attitudes for the intervention group declined, whereas, after receiving the intervention, the control comparison group demonstrated improved attitudes.

To date, no research appears to exist regarding any differential treatment effects for peer education about ASD regarding peer attitudes towards target students with high functioning ASD as compared to students with moderate to severe ASD.

### **ASD: Disclosure and Educational Interventions**

According to Campbell (2006), several publications endorse the disclosure of ASD, including the Indiana Resource Center for Autism and WTIU, the Indiana University Public Television, Lisser and Westbay (2001), and Mesibov, Shea, and Adams (2001). Some of the ASD awareness literature that has been developed to help support peer understanding of ASD includes *The Sixth Sense*, by Carol Gray (2002), *The ASD Acceptance Book*, by Ellen Sabin (2006), *Everybody is Different: A Book for Young People Who Have Brothers or Sisters with Autism*, by Fiona Bleach (2002), *Understanding Friends* (Faherty, 2005), *Can I tell you about Asperger Syndrome? A guide for friends and family* (Welton, 2004), *My Friend with Autism: A Coloring Book for Peers and Siblings*, by Beverly Bishop (2002), and *Kit for Kids* (KfK [OAR], 2012). Despite the plethora of materials available to improve peer understanding and awareness of ASD, there is a dearth of research regarding the effectiveness of these types of interventions. The anti-stigma program developed by Staniland and Byrne (2013) includes activities from *The Sixth Sense*, *Understanding Friends*, and *Can I tell you about Asperger Syndrome*, as well as other resources; however, while the lessons are described in the appendices, the series of lesson

and corresponding materials are not easily available to the public. To date, the only easily accessible program that specifically appears to be addressed with preliminary research is KfK. This publication is freely available for download to the public on the OAR website, and would therefore be an inexpensive and feasible resource for education professionals to use.

**Limitations.** One limitation of the research, particularly regarding KfK, is that it only investigates peer attitudes regarding a target student displaying classic characteristics of ASD. More information about how an intervention might differentially impact peers' attitudes towards a child with high functioning ASD as compared to a child with moderate to severe ASD would be valuable.

Another limitation of current research on educational interventions is the lack of a comparison to a more broad-based character education program. It may be that more general education about kindness and respect may serve to change students' willingness to interact with another child. A comparison to an alternative intervention would be a useful tool to investigate if students' attitudes change more broadly across groups or if attitudes towards individuals with ASD might be uniquely targeted by educating peers about ASD.

Better understanding of the mechanisms involved in peer education about ASD would be helpful in designing future interventions. For example, research regarding attribution theory and controllability suggests that peers might have more negative attitudes, including poorer behavioral intentions, towards a student with high functioning ASD due to the subtler nature of the characteristics and a lack of understanding of the nature of high functioning ASD. However, the cognitive attributions of controllability and blame have not consistently emerged as significant predictors of behavioral intentions in research regarding awareness training and ASD. In addition, the variable of prior contact has not been clearly explored in relation to attitudes of

middle-school age students. Several researchers, including Campbell (2007) and Ranson and Byrne (2014) have used a measure of “perceived similarity” as a control related to potential prior experiences with individuals with ASD, and in fact, perceived similarity does appear significantly associated with participant attitudes. However, it is unclear whether or not level of contact is actually the construct that is being measured. Of note, none of these studies have specifically made an effort to differentiate between moderate to severe ASD as compared to high functioning ASD as related to these mechanisms.

### **Summary**

Students with ASD are at risk for negative cycles of interaction with peers including that may include victimization and lacking social support. Finding ways to intervene at the peer level may be a valuable method to alter this negative trajectory. Research suggests that peers demonstrate poor attitudes and willingness to interact with students with ASD, though prior experiences with individuals with ASD may affect these attitudes. Evidence regarding educational interventions that may serve to change peer attitudes and behavioral intentions is mixed. Better understanding of potential mechanisms related to cognitive attributions, affective reactions, and contact, and how these constructs may be involved in peers’ behavioral intentions may be helpful in identifying relevant features of peer interventions. In addition, there may be unique effects regarding peers’ behavioral intentions towards students with high functioning ASD that have not yet been explored.

### **Purpose and Hypotheses**

The purpose of this study was to expand the investigation of the KfK intervention in order to explore any changes in peers’ behavioral intentions that may be associated with increased understanding about ASD and to specifically examine any differential effects

regarding behavioral intentions towards a child displaying characteristics of moderate to severe ASD as compared to high functioning ASD. The effects of the KfK intervention were investigated alongside a general character education lesson to control for potential alternative explanations. In addition, the potential mechanisms that may be involved in any changes in behavioral intentions were explored, including the role of cognitive attributions, affect (specifically anger and sympathy), and prior contact. Sex differences in participants were also examined. The hypotheses were as follows:

1. Peers will initially demonstrate the poorest behavioral intentions towards the target child displaying characteristics of high functioning ASD as compared to the child with moderate to severe ASD or a typically developing control prior to the intervention
2. Higher rates of contact will be associated with higher behavioral intentions towards the target student with ASD in either ASD condition
3. Following the KfK intervention, peers will demonstrate significantly greater improvements in behavioral intentions towards a target student with high functioning ASD as compared to the child with moderate to severe ASD or a typically developing control
4. Peers in the KfK intervention will demonstrate the largest change in behavioral intentions towards a target student with high functioning ASD, a mild change towards a student with moderate to severe ASD, and no change towards the typically developing student
5. To test attribution theory, the association of cognitive attributions and emotional reactions with behavioral intentions will be explored. Results supporting this theory will include a significant amount of variance explained by the difference between cognitive attributions and behavioral intentions that are mediated by emotional reactions (i.e., high

ratings of controllability/responsibility associated with poorer behavioral intentions, mediated by higher ratings of anger; low ratings of controllability/responsibility associated with higher behavior intentions, mediated by higher ratings of sympathy).

6. Changes in cognitive attributions (reduced ratings of controllability/responsibility) and emotional reactions (less anger, more sympathy) are expected in association with the KfK intervention.
7. Following the character education control lesson, improvements in behavioral intentions will occur broadly across all three groups and not uniquely to the target student with high functioning ASD.

## **Method**

### **Participants and Sampling Procedures**

A total of 353 middle school students were recruited to participate in this study from two middle schools in a small town in a Southeastern state. A sample size of 120 middle school students was desired based on power analysis for a repeated measures analysis of variance with six groups with an alpha set at .05, and power set at .80 (G-power; Faul, Erdfelder, Lang, & Buchner, 2007). Approximately half were male (49.6%) and half were female (50.4%). Sixty percent of participants were white, 20% were Hispanic/Latino, and 11% were African American; 7.9% reported another or “other” race or ethnicity. Fifty-two percent were sixth graders and 48 percent were seventh graders.

The principal investigator followed district level procedures for research in the relevant schools and contacted the principals at each school to provide an overview of the study purpose and obtain permission to initiate recruitment in that respective school. The principal investigator then contacted teachers to develop a plan for sharing information about the study. An opt-out

form was sent out to parents on two separate occasions over a three-week period prior to initiation of study procedures. Students gave assent by completing the questionnaire packets; students who chose not to participate were given an alternative activity by their teacher.

### **Dependent Measures**

**Shared Activities Questionnaire (SAQ).** The Shared Activities Questionnaire (SAQ) is an assessment of the behavioral intentions of participants regarding engagement in various activities with a target individual. The SAQ includes 24 total items, with 12 items in each of three domains: General Social, Academic, and Active Recreational. The Social domain includes items such as watching television together, sharing games or books, and asking the student to join a group of friends. The Academic domain covers activities such as working in the library together, working on projects together, or being in the same reading group. The Recreational domain addresses activities such as going to a park, out to dinner, or to the movies. In a recent revision of this scale by Campbell (2008), raters indicate their willingness to engage in each activity with the target individual by selecting a number on a scale from 1 through 5, which read: *No, Definitely Not* (1), *Probably Not* (2), *Maybe* (3), *Probably* (4), and *Yes, Definitely* (5). The SAQ has been used to examine the behavioral intentions of students towards several areas of disability, including autism. Morgan et al. (1996) reported establishing factorial validity with elementary school students. Strong internal consistency reliability has been found, with Cronbach's alpha exceeding .80 for total scores as well as factor scores for most samples. Campbell (2008) determined that the SAQ was a reliable and valid measure of middle school students' behavioral intentions toward autism, with Cronbach's alpha of .97 for the total score, .92 for the Social Domain score, .92 for the Academic Domain score, and .94 for the Recreational Domain score. A confirmatory factor analysis of the questionnaire's three-factor

model indicates that the three-factor structure is a stronger fit than a simple one-factor model. Factor loadings for each of the items within their established domain range from .72 to .83. For the present study, Cronbach's alpha for the SAQ was .95, suggesting exceptional internal consistency. For the domain scales, Cronbach's alpha was .89 for the Social Domain, .90 for the Academic Domain, and .90 for the Recreational Domain, which suggests strong internal consistency for the domains of the measure. See Appendix A.

**Childhood Autism Rating Scale (CARS; modified).** A modified version of the Childhood Autism Rating Scale (CARS) was created by Griffin (2016) to examine peers' ability to rate observed behaviors of a target child. The modified measure uses more student-friendly language appropriate to the age of middle school participants and has eliminated items that could not be rated in the context of the videos used in the study. The total score can be compared to the normative scores but prorated given the alterations of the original scale by dividing the numbers of remaining items by the original number of items and multiplying the score by that number. Participants' ratings were expected to reflect the levels of displayed impairment by the target student in the different videotaped conditions, with higher ratings associated with more severe behaviors. With this modified rating scale, a score of 11-21 is in the non-ASD range, greater than 21 up to 26 is in the mild to moderate ASD range, and from 27 to 44 is in the severe ASD range. Cronbach's alpha for the modified CARS used by Griffin was .92, which suggests strong internal consistency. For the present study, Cronbach's alpha for the modified CARS was .90, also suggesting strong internal consistency for this measure. See Appendix B.

**ASD Pre- and post-test (understanding/awareness about ASD).** A brief assessment consisting of true-false questions relevant to the content in the KfK intervention was developed

to investigate knowledge gain by participants related to key content in the intervention. See Appendix C.

### **Mediating Variables**

**Adapted version of the Measure of Disease-Related Stigma (MDRS).** A revised version of the Measure of Disease-Related Stigma (MDRS) was created for use in this study; the original version of the MDRS was developed and validated for use with college students by Stump, LaPergola, Cross, and Else-Quest (2016). The original MDRS includes items addressing cognitive attributions, emotional reactions, and behavioral intentions of participants. Three subscales were used from this measure, which cover the two major constructs of cognitive attributions and emotional reactions: 1) *Cognitive Attributions*, which includes items addressing controllability, responsibility, and blame; 2) *Anger*; and 3) *Sympathy*. Items on the MDRS are rated on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Stump et al. found Cronbach's alpha of .97 for the Cognitive Attributions subscale, suggesting strong internal consistency. In addition, results of structural equation modeling by Stump et al. supports the discriminant validity of the *Cognitive Attributions*, *Anger*, *Sympathy* subscales. The wording of individual items was changed to reference the target student's general behavior rather than a specific disease or condition (which would have been, in this case, ASD). Items were mixed together rather than grouped by subscale when presented to participants to minimize the effects that answering question across any one group of items might have on another domain. For the present study, Cronbach's alpha was .85 for the Cognitive Attributions subscale, .80 for the Anger subscale, and .73 for the Sympathy subscale, which suggests acceptable internal consistency for all three subscales of this measure. See Appendix D.

## **Covariate**

**Level of Contact.** A single item addressing participants' level of contact with individuals with ASD was developed using an 8-point Likert-type scale. Participants were asked, "How much have you been around someone with autism?" and provided ratings from 1 (*not at all*) to 8 (*almost always*). The rating scale also included an example associated with each rating. These examples were adapted from the *Level of Contact Report*, a rating scale originally used by Holmes et al. (1999) regarding contact with individuals with schizophrenia and adapted for use regarding contact with individuals with ASD by Gardiner and Iarocci (2014). For example, for a rating of 1, the example is, *I have never observed a person I was aware had autism*, and for a rating of 8, the example is, *I live with someone with autism*. See Appendix E.

## **Treatment Conditions**

**Videotaped vignettes.** Three videotaped vignettes were used that were created by Griffin (2016) for her thesis study. These vignettes were designed to depict a middle school age child, the target child of the video, in a brief interaction with an adult and with a peer. Three versions of the video were filmed with the same actors in order to provide a controlled representation of three conditions: 1) a condition depicting a typically developing (TD) target child, 2) a condition depicting the target child with moderate to severe ASD (AU), with classic signs of autism, including lack of eye contact, repetitive motor movements, and echolalia and 3) a condition depicting the target child with a high functioning form of autism (HFA), including odd/atypical quality to speech (more formal speech with robotic-like quality), perseveration on topics, and difficulty taking the perspective of others. The interactions that were scripted and filmed provided an opportunity for multiple aspects of autism symptomology to be displayed, and created the three video conditions for the study –TD, AU, and HFA. Griffin (2016) found that

participants were able to differentially rate the behavior of the target student in these videos in a manner consistent with the level of symptomology displayed. Using the modified CARS, participants rated the AU video condition in the *severe* range, the HFA condition in the *mild to moderate* range, and the TD condition in the *typical* range, suggesting the videos adequately represent the desired level of characteristics.

**Psychoeducational Intervention: *Kit for Kids*.** The *Kit for Kids* ([KfK]; OAR, 2012) is a peer education program created for upper elementary and middle school students. This program includes a teacher guide, peer handouts, and a poster that are designed to improve peer understanding and awareness of ASD through the hypothetical story of Nick, a student with ASD who has recently joined an inclusive classroom. The peer handouts share Nick's story and experiences through the eyes of his peers as they learn more about Nick. The materials provide information about symptoms of ASD, address potential misunderstandings about ASD, and provide specific strategies for peers to use when interacting with someone with ASD at school. The teacher guide offers suggestions for how to facilitate a lesson using the handout and includes discussion questions to guide students as they read through the handout individually or as a group; the poster highlights common characteristics of ASD, including areas of difficulty as well as strengths. This lesson lasts about 30 minutes. Campbell (2016) created a procedural fidelity checklist that was used to self-monitor consistent implementation of the lesson in the current study. See Appendix F for the KfK procedural fidelity checklist.

**Alternate Activity: Character Education Lesson.** As a control, students not in the intervention group received an alternative, generic character education lesson targeting being accepting of others. Online character education materials posted by the West Virginia Department of Education and South Carolina Department of Education were explored and a

current middle school guidance counselor was consulted to develop an appropriate alternative activity that a school counselor might use to target broader but similar concepts such as similarities and differences, diversity, and acceptance. Based on this input, a lesson of about 30 minutes was developed by the principal investigator (see Appendix G for the character education materials and checklist).

### **Procedures**

Each classroom was assigned to one of two main intervention conditions – the psychoeducation intervention group (PI) or the character education control group (CE). Within each classroom, students viewed one of the three videos TD, AU, or HFA. Thus, there were six total groups: 1) PI-TD, 2) PI-AU, 3) PI-HFA, 4) CE-TD, 5) CE-AU, and 6) CE-HFA. In order to maintain relatively equal numbers of participants in each intervention condition, the number of participating students within each class was monitored along with the number of potential participants within each intervention condition. Classrooms were then assigned to one of the intervention conditions based on the number of students participating in that class and the tallied total in each group. Data collection packets were pre-coded and sorted in sequential order by the three video conditions in order to maintain relatively equal numbers within each video condition. In addition, in order to maintain relative equal numbers of male and female students within each video condition, packets were passed out first to females and then to males.

The principal investigator worked individually with each classroom teacher to determine a location and time for the initial data collection phase, intervention phase, and the post-intervention data collection phase of the study to take place. The classroom teacher was provided with a script to collect data at the initial data-collection phase and post-intervention phase. The principal investigator carried out all lessons at one middle school. At the other

middle school, the principal investigator worked with the guidance counselor to carry out the intervention phase of the study. The counseling intern carried out the CE lessons at that school and the principal investigator carried out the PI lessons.

**Initial data collection.** The classroom teacher followed procedures to collect initial information from participants approximately one week before the intervention condition was implemented. The classroom teacher was given a script to introduce the video by telling students they would be watching a video with a student about their age and to think of the subject in the video as a student who could be coming to their school. Students then watched the specific video on their individual laptop based on the video condition to which they were assigned (that is, the condition that was pre-coded on their questionnaire packet). After the video concluded, students completed measures in the following order: a) a brief demographic questionnaire, b) the SAQ c) the adapted MDRS, d) the modified CARS, e) the Level of Contact question, and f) the pre-test related to the KfK content. This order was selected in order to avoid any bias the later measures might have on participants' expressed behavioral intentions on the SAQ. Teachers were instructed to read aloud all directions and to read aloud individual items to students upon request.

**Intervention session.** After the initial data was collected, the intervention was carried out approximately one week following data collection. The principal investigator and guidance counselors implemented either the psychoeducational intervention or the character education lesson based on the assigned condition for that class. A procedural fidelity checklist was used to self-monitor consistent delivery of the intervention and character education lessons; fidelity was 100% for all lessons.

**Post-intervention data collection.** Approximately two weeks following the intervention, the same procedures for data collection were conducted as in the initial data collection. Participants were told that they would watch a video and should again think of the child in the video as a student who could be coming to their school. Participants viewed the video again based on their previously assigned video condition. They then completed the packet in the following order: a) the SAQ, c) the adapted MDRS, and c) the KfK post-test.

**Confidentiality.** Student ID's, teacher names, and class period were collected during the initial data collection phase in order to pair pre and post-intervention data with the correct participants. The classroom teacher stored data from the initial data collection phase in a secure location until the post-intervention data collection phase. After all data was collected, identifying information was replaced with an alpha-numeric code in order to de-identify the data.

### **Research Design and Data Analysis**

**Preliminary analyses.** In order to explore any differences in participants' ability to discriminate the characteristics of ASD across the three video conditions (TD, AU, and HFA), a one-way analysis of variance (ANOVA) was conducted with the independent variable as video condition and the dependent variable as the modified CARS. All analyses were conducted using IBM SPSS Statistics, Version 24.

**Intervention analyses.** Results were first analyzed with a doubly repeated multivariate analysis of variance (RM-MANOVA). The dependent variables were behavioral intentions (as measured by the SAQ), cognitive attributions (based on the *Cognitive Attributions* subscale of the modified MDRS) and emotional reactions (based on the *Emotional Reactions* subscales of the modified MDRS – *Anger* and *Sympathy*) and the independent variables were intervention condition (PI or CE) and video condition (TD, AU, or HFA) with a total of six assigned groups.

First, the main effects of video condition and lesson were examined related to overall differences in participants' ratings. Second, the effects related to time were examined to determine any differences in the primary measures as a function of time. Main effects were explored as well as two way interactions related to any differences in participants' ratings before and after the intervention, a) based on intervention group (i.e., did any changes in ratings pre and post intervention vary based on the type of intervention), and b) based on video condition (i.e., did any changes in ratings pre and post intervention vary based on the video the participant viewed – TD, AU, or HFA). Three-way interactions involving time were also explored. Specifically, changes over time in ratings as a function of both intervention group and video condition were examined.

Next, the effects related to measure were explored. The main effect of measure was examined to determine if participants' ratings varied by measure. Two-way interactions between measure and video condition and measure and lesson condition were examined. That is, were there significant differences in ratings on the primary measures between intervention groups and were there significant differences in ratings on the primary measures across video conditions? The three-way interaction of measure, video condition, and lesson was explored but was of less interest (as the hypotheses explored relate to lesson effects that also include time).

Finally, four-way interactions were explored related to the combined effects of time and measure. Specifically, changes over time in SAQ ratings as a function of intervention group and video condition were examined. Of particular interest was if SAQ ratings improved uniquely for the PI-AU and PI-HFA group, as was predicted. It was also expected that there would be changes in the Cognitive Attributions subscale and emotional reactions subscales (Anger and Sympathy) on the modified MDRS as a function of intervention group and video condition. Of

interest was if the ratings on the Cognitive Attributions subscale decreased uniquely for the PI-AU and PI-HFA groups (that is, as a function of video condition and lesson), as was predicted. Also of interest was if ratings on the Anger subscale decreased and if ratings on the Sympathy subscale increased for participants as a function of intervention condition and video condition.

**Analysis of covariates.** Follow-up analyses included exploration of the covariates of sex and Level of Contact. Sex and Level of Contact were investigated as additional independent variables along with intervention and video conditions; the dependent variables were the SAQ ratings, modified MDRS Cognitive Attributions subscale, Anger subscale, and Sympathy subscale. A main effect of sex and a main effect of level of contact were explored. A main effect of sex and interaction effect of sex and measure were of interest, particularly in relation to the SAQ – that is, do males and females report significantly different behavioral intentions? Interactions between sex and intervention condition and between sex and video condition were also examined. Interactions between level of contact and intervention condition and level of contact and video condition were analyzed. Of particular interest was the interaction between level of contact and video condition on the primary measures; that is, whether or not a higher level of contact was associated with more willingness to interact with the AU or HFA condition. Finally, interactions between sex, intervention group, and video condition were explored as well as interactions between level of contact, intervention group, and video condition on the primary measures.

The ASD pre- and post-test results were examined to understand students' knowledge about ASD. The number of correct responses were entered as a dependent variable in a repeated measures ANOVA, with intervention condition as an independent variable; this analysis was used to examine student knowledge gain as a result of the psychoeducational intervention.

**Regression analysis.** In order to specifically evaluate the conceptual model involving the effects of cognitive attributions on behavioral intentions as mediated by emotional reactions, hierarchical multiple regression was used to test for mediation using the approach advocated by Baron and Kenny (1986). Because the conceptual model explored in this study is related to perceptions of individuals with disabilities, only the video condition of AU and the video condition of HFA were explored. These video conditions were explored in separate analyses, with the variable of Sympathy explored as a mediator for the AU condition and the variable of Anger explored as a mediator for the HFA condition. First, a correlation analysis was run to determine if the predictor (i.e., Cognitive Attributions), mediator (i.e., Sympathy or Anger), and dependent variable (i.e., behavioral intentions, as measured by the SAQ) were significantly related to one another for each ASD video condition. If all three were significantly related, hierarchical regression was conducted with the predictor entered in the first step of the equation and the mediating variable added in the second step. Changes in the effects of the predictor variable in the second block would suggest mediation had occurred.

## **Results**

Three hundred fifty-three students from eight general education classrooms participated in this study. Participants who completed less than 75% of scales for the primary outcomes (the SAQ and revised MDRS) were eliminated from the final analyses, which excluded 63 participants. Chi-square analysis did not reveal significant differences between the excluded participants and the total sample across variables of grade, sex, race/ethnicity, video condition, or lesson condition. Another 18 participants were excluded due to being absent on the day the lesson was conducted. Thus, 272 participants were included in the primary analyses. Approximately half were female (50.7%) and half were male (49.3%). Participants were fairly

evenly distributed across video condition, with 31.3% in the AU condition, 32.7% in the HFA condition, and 36% in the TD condition. See Table 1 for more details about participant characteristics overall and across video condition.

Table 1.

*Participant characteristics across conditions.*

Condition	AU		HFA		TD		Total	
	n	%	n	%	n	%	N	%
Total Participants	85	31.3	89	32.7	98	36	272	100
Lesson								
KfK (PI)	44	51.8	43	48.3	47	48	134	49.3
CE	41	48.2	46	51.7	51	52	138	50.7
Grade								
6 <sup>th</sup>	42	49.4	49	55.1	50	51	141	51.8
7 <sup>th</sup>	43	50.6	40	44.9	48	49	131	48.2
Sex								
Male	42	49.4	41	46.1	51	52	134	49.3
Female	43	50.6	48	53.9	47	48	138	50.7
Race/Ethnicity								
White	52	61.2	57	64	62	63.3	171	62.9
Hispanic/ Latino	21	24.7	15	16.9	19	19.4	55	20.2
African American	8	9.4	14	15.7	6	6.1	28	10.3
Other	4	4.7	3	3.4	11	11.2	18	6.6

*Note.* AU = AU (moderate to severe ASD) Video Condition; HFA = HFA (high functioning ASD) video condition; TD = TD (typically developing control) video condition; KfK = Kit for Kids lesson/intervention; PI = Psychoeducational intervention; CE = Character education lesson

### **Preliminary analyses**

The purpose of the preliminary analysis was to explore participants' ability to discriminate the characteristics of ASD across video conditions. Because the modified CARS ratings are based on a total score rather than an average, participants who skipped items on the

CARS were excluded, resulting in a total of 266 participants for this portion of the analyses. Results of a one-way ANOVA revealed significant differences in participants' ratings based on their assigned video condition,  $F(2, 263) = 118, p < .001, \eta^2 = .47$ . On average, the highest ratings of autism-related behaviors were given by participants in the AU video condition ( $M = 25.19, SD = 6.23$ ), followed by participants in the HFA video condition ( $M = 23.13, SD = 6.23$ ). Participants in the TD condition gave the lowest ratings ( $M = 14.02, SD = 4.25$ ). Levene's test of equality of variance was significant at the .002 level, so post hoc analysis using Games-Howell was conducted. Results indicated significant differences across all three video conditions, with AU compared to HFA significant at the  $p < .05$  level, AU compared to TD at the  $p < .001$  level, and HFA compared to TD at the  $p < .001$  level. Results suggest that, on average, participants observed the most unusual behaviors when viewing the target student who was displaying moderate to severe characteristics of ASD, somewhat fewer unusual behaviors when viewing the target student who was displaying characteristics of HFA, and the fewest unusual behaviors when viewing the target student who was portraying a typically developing individual.

### **Intervention Analyses**

A doubly repeated multivariate analysis of variance was conducted to analyze the behavioral intentions, cognitive attributions, and emotional reactions (anger and sympathy) based on video condition and intervention condition. A significant between-subjects main effect of video condition was observed  $F(2, 266) = 27.18, p < .001, \eta^2 = .17$ , suggesting that participants' ratings varied significantly based on the target student they observed (that is, the video condition). There was no main effect of lesson condition,  $F(1, 266) = .77, p = .38, \eta^2 < .01$ .

In terms of the unique effects of time, results indicate a significant within-subjects main effect of time. On average, participants' ratings decreased over time. There was no two-way

interaction between time and video condition or time and lesson, suggesting that participants' ratings did not change over time as a function of video condition or as a function of the lesson condition. There was also no three-way interaction between time, video condition, and lesson, indicating the lesson did not uniquely target any of the video conditions to result in a unique change over time for a particular video condition. The univariate effects of time of participants' ratings as a function of video condition and lesson are depicted in Table 2.

Table 2.

*Univariate effects of time as a function of video condition and lesson on participants' ratings.*

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	$\eta^2$
Time	16.30	1	16.30	30.27	<.001	.10
Time by Video Condition	1.74	2	.59	1.09	.34	.01
Time by Lesson	.06	1	.06	.10	.75	<.01
Time by Video Condition by Lesson	.26	2	.13	.24	.79	<.01
Error (Time)	143.22	266	.54			

An analysis of the unique effects of measure reveals a significant within-subjects main effect of measure. A significant measure by video condition interaction was observed, indicating that participants' ratings varied significantly across measures as a function of which target student was being rated (i.e., the video condition). A measure by lesson interaction was observed. A three-way interaction was observed among measure, video condition, and lesson. Table 3 displays the univariate effects of measure as a function of video condition and lesson on participants' ratings.

Table 3.

*Univariate effects of measure as a function of video condition and lesson on participants' ratings.*

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	$\eta^2$
Measure	747.51	2.41	309.76	107.60	<.001	.29
Measure by Video Condition	790.69	4.83	163.83	56.91	<.001	.30
Measure by Lesson	27.82	2.41	11.53	4.00	.008	.02
Measure by Video Condition by Lesson	41.09	4.83	8.51	2.996	.013	.02
Error (Measure)	1847.88	641.90	2.88			

Post-hoc analyses of the interaction between measure and video condition revealed that, on average, participants reported greater willingness to interact (i.e., SAQ ratings) with the student in the AU condition ( $p < .01$ ) and the TD condition ( $p < .01$ ) as compared to the HFA condition. The AU and TD conditions were not significantly different from one another. The average rating for the HFA condition was between “probably not” and “maybe” willing to interact ( $M = 2.95$ ,  $SD = 0.08$ ). The average ratings for the AU condition ( $M = 3.28$ ,  $SD = 0.08$ ) and the TD condition ( $M = 3.29$ ,  $SD = 0.08$ ) was between “maybe” and “probably” willing to interact. Participants’ overall ratings on the SAQ by video condition are depicted in Figure 2.

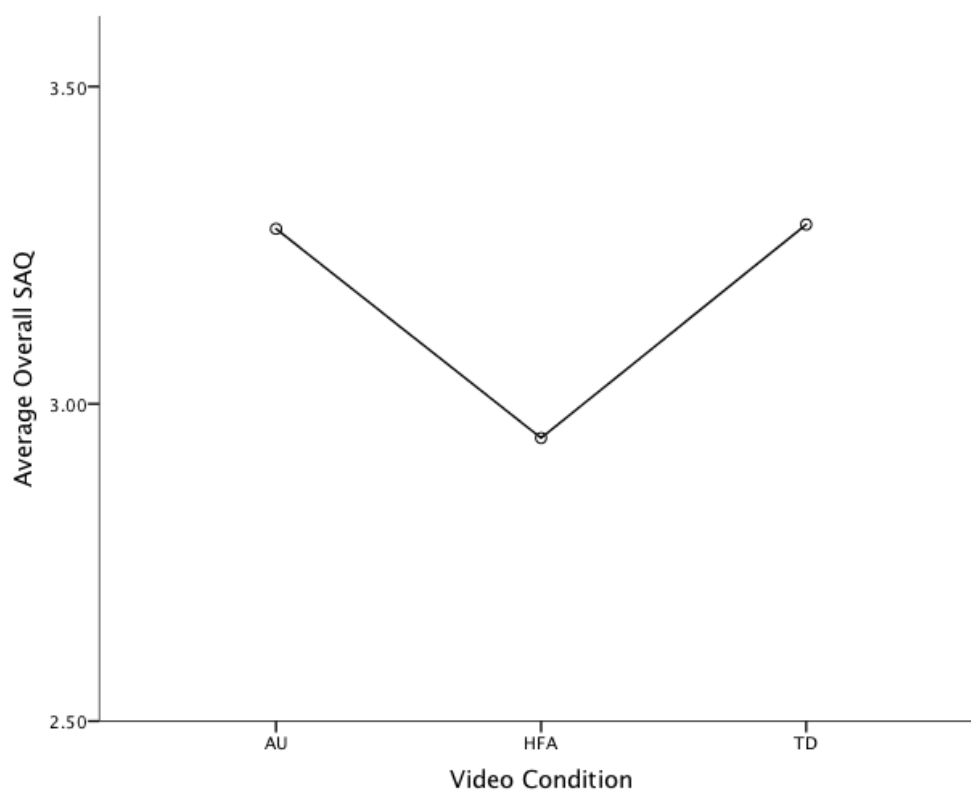


Figure 2. Average overall SAQ scores by video condition.

In terms of cognitive attributions on the adapted MDRS, participants rated the lowest cognitive attributions for the student in the AU condition as compared to the HFA condition ( $p < .001$ ) and the TD condition ( $p < .001$ ). The HFA and TD condition were not significantly different. The average rating for the AU condition ( $M = 2.20$ ,  $SD = 0.12$ ) was between “disagree” and “somewhat disagree” that the student was responsible/to blame for his behavior overall. The average rating for the HFA condition ( $M = 3.62$ ,  $SD = 0.12$ ) and the TD condition ( $M = 3.88$ ,  $SD = 0.11$ ) was between “somewhat disagree” and “neither agree nor disagree.” Participants’ overall ratings on the Cognitive Attributions subscale by video condition are shown in Figure 3.

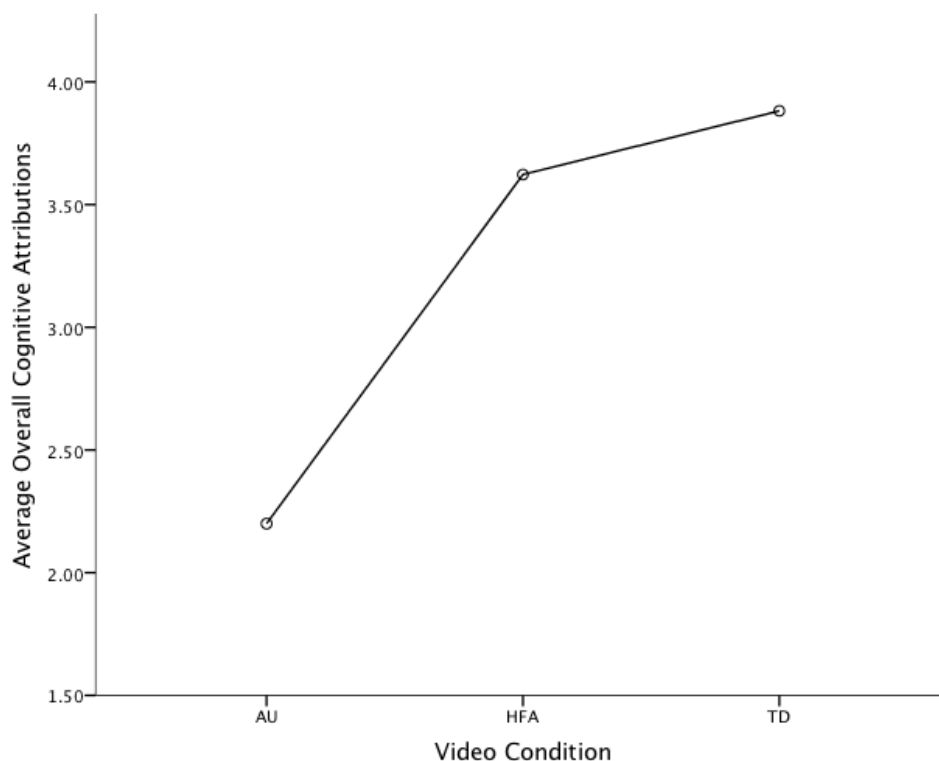


Figure 3. Average overall Cognitive Attributions subscale scores by video condition.

On the adapted MDRS Anger subscale, participants reported significantly higher ratings for the student in the HFA condition as compared to the AU condition ( $p < .001$ ) and the TD condition ( $p < .001$ ). Participants also reported higher ratings for the student in the AU condition as compared to the TD condition ( $p < .001$ ). However, average scores do not necessarily indicate feelings of anger/frustration toward the target student overall. The average rating for the HFA condition ( $M = 3.60$ ,  $SD = 0.13$ ) was between “somewhat disagree” and “neither agree nor disagree” – that is, on average, participants did not necessarily endorse *lacking* a feeling of anger/frustration, but participants did not explicitly endorse having feelings of anger/frustration (as would be indicated by a score of 5 – “somewhat agree” – or greater). The average ratings for the AU condition ( $M = 2.90$ ,  $SD = 0.13$ ) and the TD condition ( $M = 2.03$ ,  $SD = 0.12$ ) were between “disagree” and “somewhat disagree.” Figure 4 depicts participants’ overall ratings on the Anger subscale by video condition.

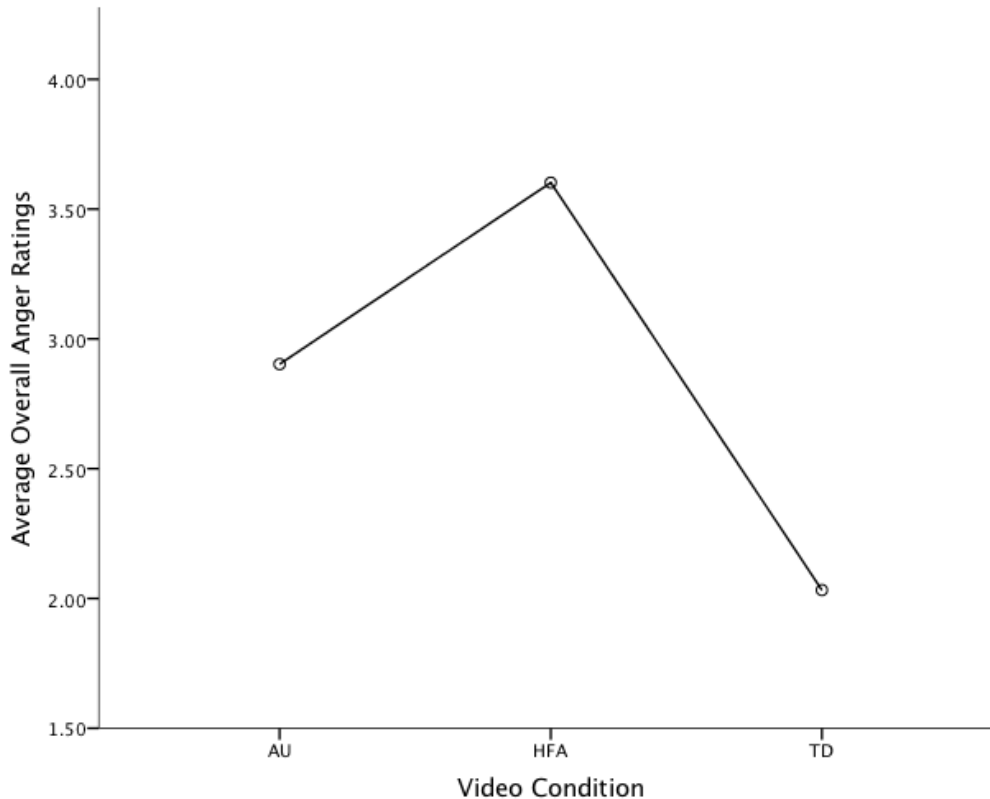


Figure 4. Average overall Anger subscale scores by video condition.

On the adapted MDRS Sympathy subscale, participants indicated the highest ratings for the student in the AU condition as compared to both the HFA condition ( $p < .001$ ) and the TD condition ( $p < .001$ ). Participants reported higher ratings for the student in the HFA condition than the student in the TD condition ( $p < .001$ ). The average rating for the AU condition ( $M = 5.36$ ,  $SD = 0.12$ ) was between “somewhat agree” and “agree.” The average rating for the TD condition ( $M = 4.42$ ,  $SD = 0.11$ ) was between “neither agree nor disagree” and “somewhat agree.” Both ratings indicate that, on average, participants endorsed some level of sympathy for the student in the AU and HFA condition. In contrast, the average rating for participants for the student in the TD condition ( $M = 3.39$ ,  $SD = 0.11$ ) was between “somewhat disagree” to “neither agree nor disagree.” Figure 5 shows participants’ average overall ratings on the Sympathy subscale by video condition.

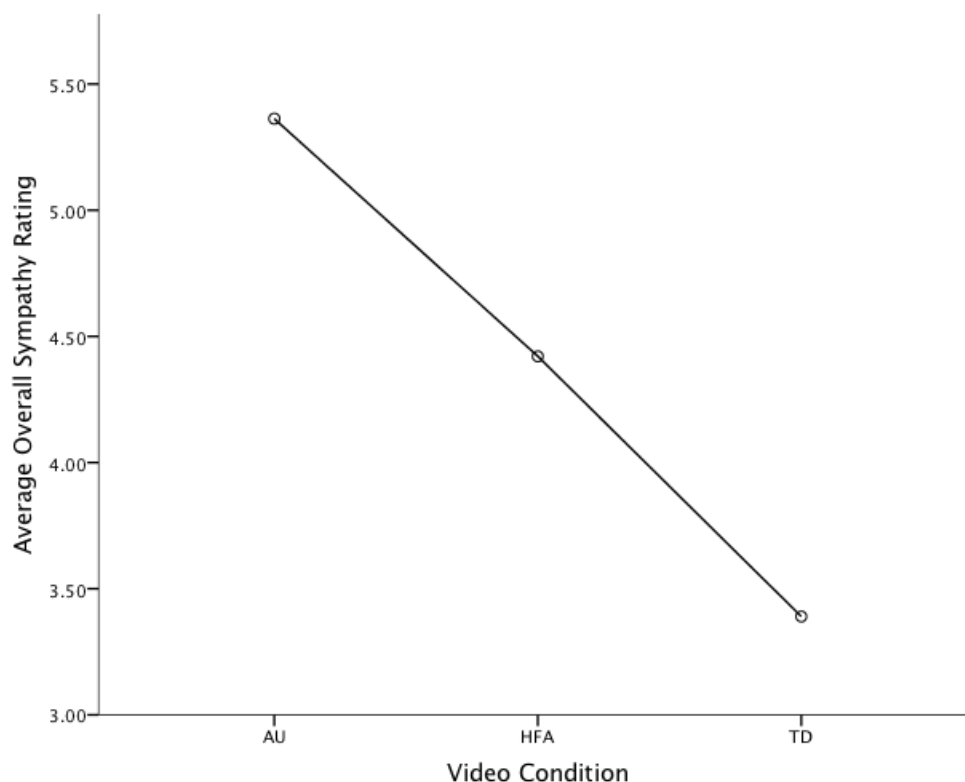


Figure 5. Average overall Sympathy subscale scores by video condition.

Because the two-way interaction of video condition and lesson and the three-way interaction of measure, video condition, and lesson did not include an effect of time, follow-up analysis of these interactions was less meaningful. Post-hoc analysis was conducted to determine if there were differences for participants within each of the video conditions (AU, HFA, or TD) who had the KfK lesson as compared to those who had the CE lesson on each of the primary measures. Results indicate that for the SAQ, adapted MDRS Anger subscale, and adapted MDRS Sympathy subscale, there was no significant difference in the overall average ratings of participants within each of the video conditions (AU, HFA, or TD) who had the KfK lesson as compared to those who had the CE lesson. For the adapted MDRS Cognitive Attributions subscale, there was a significant difference for the overall average ratings of participants in the HFA condition who had the KfK lesson as compared to the CE lesson ( $p <$

.001), but not the TD or AU conditions. Thus, results suggest some possible small unplanned difference in groups; however, this interaction accounts for a very small proportion of the overall variance (i.e.,  $\eta^2 = .03$  for the two-way interaction, or just 3% of the variance;  $\eta^2 = .02$  for the three-way interaction, or just 2% of the variance).

In terms of the combined effects of measure and time, a significant measure by time interaction was observed. In addition, a three-way interaction among time, measure, and video condition was seen, indicating that participants' ratings across measures changed over time in a unique way based on the target student that was being rated by participants (that is, the video condition). An interaction of time, measure, and lesson was not observed, indicating that participants' ratings across measures did not change uniquely as a function of the lesson in which they participated. In addition, as noted previously, an interaction of time, measure, lesson, and video condition was not found, suggesting that participants' ratings across measures did not change over time as a function of the lesson and the target student they observed (i.e. video condition). The univariate effects of time and measure as a function of video condition and lesson are displayed in Table 4.

Table 4.

*Univariate effects of time and measure as a function of video condition and lesson on participants' ratings.*

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	$\eta^2$
Time by Measure	28.79	2.35	12.26	17.32	<.001	.06
Time by Measure by Video Condition	17.92	4.70	3.82	5.39	<.001	.04
Time by Measure by Lesson	.90	2.35	.38	.54	.61	<.01
Time by Measure by Video Condition by Lesson	4.71	4.70	1.00	1.42	.22	.01

Table 4 (continued).

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	$\eta^2$
Error (Time by Measure)	442.05	624.60	.71			

**Measure by video condition by time.** Post-hoc analyses of the interaction between measure, video condition, and time indicated that for the SAQ, participants' overall willingness to interact decreased over time ( $p < .05$ ), but this change varied by video condition. Participants' ratings on the SAQ only decreased significantly for the TD condition ( $p < .01$ ). The decrease for the AU condition was not significant ( $p > .05$ ), and the HFA condition did not decrease or change significantly ( $p > .05$ ). Prior to the intervention, participants expressed significantly less willingness to interact with the student in the HFA condition as compared to the AU condition ( $p < .01$ ) and the TD condition ( $p < .01$ ). Ratings on the SAQ were not significantly different between the AU and TD condition. However, after the intervention, the differences in willingness to interact across video conditions were no longer significant. Both prior to and after the intervention, participants' ratings of behavioral intentions were between "maybe" and "probably" willing to interact with the student in the TD condition and AU condition on average. Participants' ratings indicated they were, on average, "probably not" to "maybe" willing to interact with the student in the HFA condition both pre- and post-intervention. Participant ratings on the SAQ by time and video condition are depicted in Figure 6.

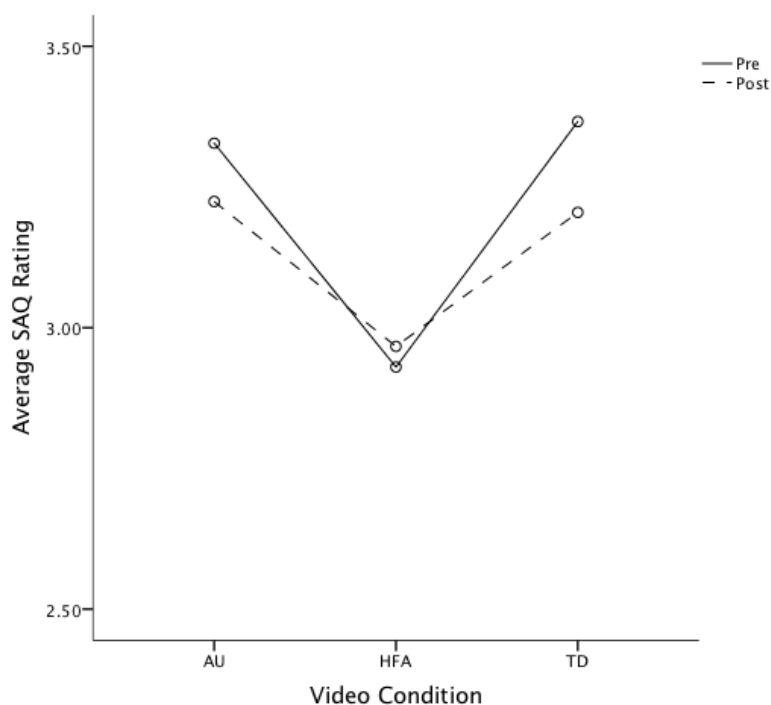


Figure 6. Average SAQ scores by time and video condition.

For the adapted MDRS Cognitive Attributions subscale, participants ratings decreased significantly over time overall ( $p < .001$ ) as well as for each video condition. Prior to the intervention, participants' ratings of cognitive attributions (that is, perceived responsibility/blame for behavior) were significantly lower for the student in the AU condition as compared to both the HFA condition ( $p < .001$ ) and the TD condition ( $p < .001$ ), but the TD and HFA condition were not significantly different. After the intervention, participants continued to provide significantly lower ratings of cognitive attributions for the HFA ( $p < .001$ ) and TD ( $p < .001$ ) conditions as compared to the AU condition. In addition, ratings of cognitive attributions for the HFA condition were significantly lower than the TD condition at this time point ( $p < .05$ ). Prior to the intervention, on average, participant ratings in the AU condition indicated they “disagreed” to “somewhat disagreed” with statements of controllability/blame. Participant ratings in both the HFA condition and the TD condition indicated they “neither agreed nor

disagreed” to “agreed” with statements of controllability/blame. After the intervention, participants ratings in the AU condition indicated they “strongly disagreed” to “disagreed” with statements of controllability/blame. Participant ratings in both the HFA condition and the TD condition indicated they “somewhat disagreed” to “neither agreed nor disagreed” with statements of controllability/blame. Participant ratings on the adapted MDRS Cognitive Attributions subscale by time and video condition are displayed in Figure 7.

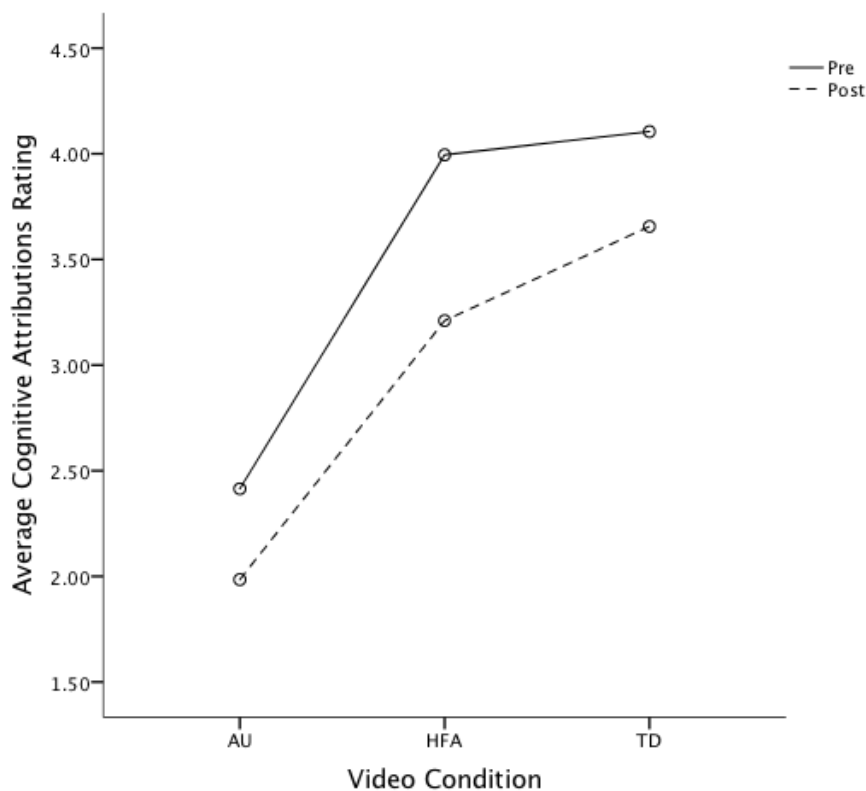


Figure 7. Average Cognitive Attributions subscale scores by time and video condition.

In terms of the Anger subscale on the adapted MDRS, the change in participants’ ratings overall from pre-intervention to post-intervention was not significant ( $p > .05$ ). Ratings on the Anger subscale only changed significantly (decreased) for participants in the HFA condition ( $p < .01$ ). Prior to the intervention, participants indicated lower ratings for the TD condition as

compared to the AU condition ( $p < .01$ ) and the HFA condition ( $p < .001$ ). Participants provided significantly lower ratings for the AU condition as compared to the HFA condition ( $p < .001$ ). After the intervention, participants continued to provide the lowest ratings for the TD condition. However, the difference between the AU and HFA condition was no longer significant. Prior to the intervention, participant ratings in the AU and TD condition indicated they “disagreed” to “somewhat disagreed” with statements of anger/frustration towards the target student on average. Participant ratings in the HFA condition indicated they “somewhat disagreed” to “neither agreed nor disagreed” with statements of anger/frustration towards the target student. After the intervention, participant ratings in both the AU and HFA conditions indicated they “somewhat disagreed” to “neither agreed nor disagreed” with statements of anger/frustration on average. Participants in the TD condition indicated they “strongly disagreed” to “disagreed” with statements of anger on average. Figure 8 depicts participant ratings on the Anger subscale by time and video condition.

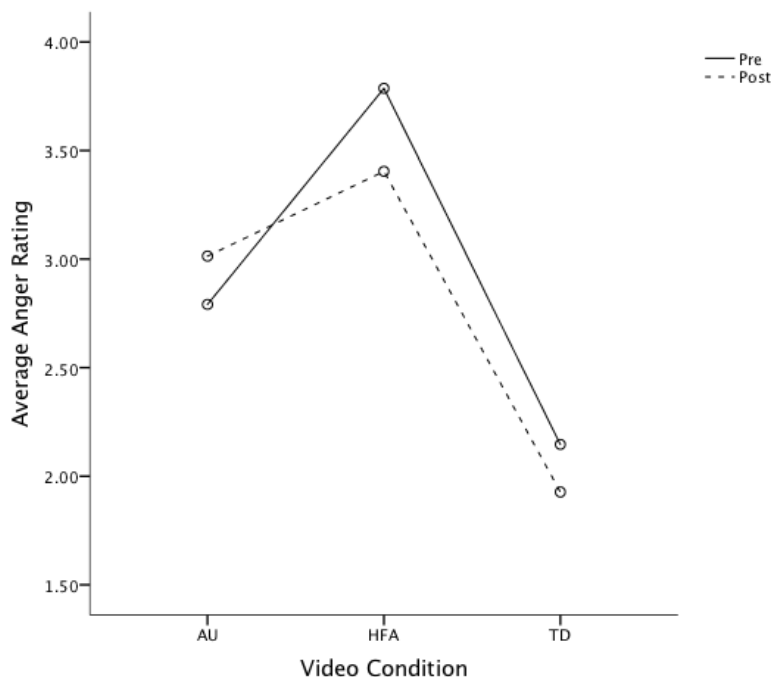


Figure 8. Average Anger subscale scores by time and video condition.

For the Sympathy subscale on the adapted MDRS, there was no significant change in participants' ratings from pre-intervention to post-intervention overall. Ratings on the Sympathy subscale only changed significantly (increased) for participants in the HFA condition ( $p < .01$ ). At both pre-intervention and post intervention, participant ratings were significantly higher for the AU condition as compared to both the HFA condition ( $p < .001$ ) and the TD condition ( $p < .001$ ), and participant ratings for the HFA condition were significantly higher than the TD condition ( $p < .001$ ). At both pre- and post-intervention, participants' ratings in the TD condition indicated they "somewhat disagreed" to "neither agreed nor disagreed" with statements of sympathy toward the target student on average. Participants' ratings in the HFA condition indicated they "neither agreed nor disagreed" to "somewhat agreed" with statements of sympathy, and participants' ratings in the AU condition indicated they "somewhat agreed" to "agreed" with statements of sympathy. Figure 9 displays participant ratings on the Sympathy subscale by time and video condition. Means and standard deviations of each measure, pre- and post-intervention, by lesson condition and across video condition, can be seen in Table 5.

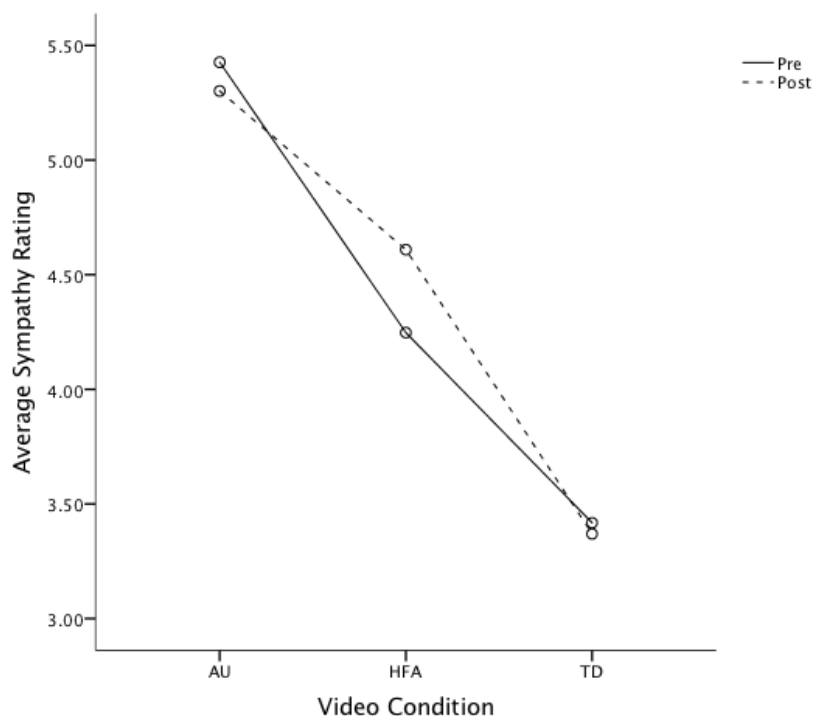


Figure 9. Average Sympathy subscale scores by time and video condition

Table 5.

*Means and Standard Deviations of average SAQ ratings (pre and post), and average MDRS subscale ratings (pre and post) by lesson and across video condition.*

Condition	AU		HFA		TD		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>SAQ</i>								
Pre	3.33	.82	2.93	.78	3.36	.81	3.21	.82
KfK	3.31	.81	3.00	.79	3.44	.77	3.26	.80
CE	3.34	.84	2.86	.78	3.29	.84	3.17	.85
Post	3.22	.84	2.96	.75	3.20	.78	3.13	.79
KfK	3.23	.86	3.04	.78	3.28	.73	3.19	.79
CE	3.22	.83	2.89	.72	3.13	.82	3.08	.80
<i>MDRS-Cognitive Attributions</i>								
Pre	2.41	1.21	4.01	1.47	4.11	.96	3.55	1.44
KfK	2.42	1.22	3.41	1.39	4.09	.98	3.32	1.38

Table 5 (continued).

Condition	AU		HFA		TD		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>MDRS-Cognitive Attributions</i>								
Pre	2.41	1.21	4.01	1.47	4.11	.96	3.55	1.44
KfK	2.42	1.22	3.41	1.39	4.09	.98	3.32	1.38
CE	2.41	1.21	4.58	1.33	4.12	.96	3.77	1.47
Post	1.99	1.17	3.23	1.51	3.66	1.17	3.00	1.47
KfK	1.99	1.19	2.61	1.24	3.59	1.31	2.75	1.41
CE	1.97	1.16	3.81	1.52	3.72	1.02	3.23	1.49
<i>MDRS-Anger</i>								
Pre	2.79	1.40	3.80	1.45	2.14	1.20	2.88	1.51
KfK	2.76	1.43	3.51	1.41	2.32	1.27	2.85	1.45
CE	2.82	1.39	4.06	1.44	1.97	1.11	2.92	1.57
Post	3.02	1.52	3.41	1.46	1.93	1.10	2.75	1.50
KfK	3.07	1.48	3.29	1.37	1.98	1.06	2.76	1.42
CE	2.96	1.58	3.52	1.55	1.88	1.14	2.75	1.58
<i>MDRS-Sympathy</i>								
Pre	5.43	1.18	4.24	1.37	3.42	1.14	4.31	1.48
KfK	5.52	1.08	4.49	1.43	3.45	1.13	4.46	1.48
CE	5.34	1.28	4.00	1.29	3.38	1.16	4.17	1.47
Post	5.30	1.17	4.60	1.27	3.36	1.16	4.37	1.44
KfK	5.14	1.11	4.78	1.29	3.51	1.25	4.46	1.40
CE	5.46	1.21	4.43	1.23	3.23	1.05	4.29	1.47

*Note.* AU = AU (moderate to severe ASD) Video Condition; HFA = HFA (high functioning ASD) video condition; TD = TD (typically developing control) video condition; SAQ = Shared Activities Questionnaire; KfK = Kit for Kids lesson/intervention; CE = Character education lesson; MDRS = Measure of Disease Related Stigma (adapted version)

### Analysis of Covariates

**Contact level.** Participants' responses to the question "how much have you been around someone with autism" suggest a range of interaction with individuals with ASD, from "not at all" (a rating of 1) to "almost always" (8). The variable of contact was collapsed into three levels

(low, medium, and high) for a follow-up analysis. Almost 10% (9.6%) of participants provided a response of “not at all,” 8.1% of participants responded “almost not at all” (a rating of 2), and 24.6 % of participants provided a response of “rarely” (a rating of 3). These ratings were combined to create the “low” level of contact group, with a total of 115 participants (42.3%). Almost 16% (15.8%) of participants indicated they “occasionally” had contact with someone with ASD and 19.9% of participants responded that they “sometimes” had contact with someone with ASD. These two groups were combined to create the “medium” level of contact group, with a total of 97 participants (35.7%). Almost 12% (11.8%) of participants responded that they “often” had contact with someone with ASD, 4.8% indicated that they “very often” had contact with someone with ASD, and 2.6% reported that they “almost always” had contact with someone with ASD. These participants were combined into the “high” level of contact group with a total of 52 participants (19.1%). Eight participants did not answer the level of contact question.

In order to analyze the behavioral intentions, cognitive attributions, and emotional reactions (anger and sympathy) based on video condition and intervention condition with contact included as an additional independent variable, a follow-up doubly repeated multivariate analysis of variance was conducted. Participants who did not answer the contact question were excluded from this portion of the analyses. Results indicated that a two-way interaction between contact level and measure was significant, as well as the three-way interaction among contact level, measure, and video condition. No other effects involving contact were significant. In general, though significant, contact contributed very little to the overall variance of the model (i.e., only 4%). Table 6 displays the overall means of each measure by contact and video condition, and Table 7 presents the results of all univariate effects involving contact.

Table 6.

*Means and Standard Deviation of average SAQ ratings (overall), and average MDRS subscale ratings (overall) by contact across condition.*

Condition	AU		HFA		TD		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SAQ	3.39	.79	3.03	.72	3.30	.76	3.17	.77
<i>Contact</i>								
Low	3.05	.85	2.83	.79	3.25	.80	3.04	.82
Medium	3.37	.69	2.87	.54	3.34	.81	3.20	.72
High	3.76	.57	3.37	.79	3.31	.60	3.48	.67
MDRS-Cognitive Attributions	2.12	1.05	3.49	1.35	3.90	.91	3.27	1.32
<i>Contact</i>								
Low	2.21	1.18	4.02	1.31	3.81	.92	3.45	1.39
Medium	2.34	1.02	3.26	1.27	3.92	.91	3.17	1.25
High	1.79	.83	3.18	1.43	3.96	.92	2.98	1.38
MDRS-Anger	2.65	1.33	3.43	1.25	2.02	1.04	2.81	1.37
<i>Contact</i>								
Low	3.36	1.49	4.18	1.17	1.99	1.00	3.17	1.53
Medium	2.74	1.11	3.26	1.15	1.99	1.00	2.66	1.20
High	1.85	.76	2.85	1.18	2.09	.113	2.27	1.13
MDRS-Sympathy	5.39	1.01	4.51	1.20	3.42	1.00	4.34	1.34
<i>Contact</i>								
Low	5.36	1.11	4.08	.98	3.19	.94	4.21	1.34
Medium	5.29	.97	4.75	1.39	3.55	1.08	4.53	1.36
High	5.54	.98	4.69	1.17	3.51	1.00	4.58	1.33

*Note.* AU = AU (moderate to severe ASD) Video Condition; HFA = HFA (high functioning ASD) video condition; TD = TD (typically developing control) video condition; SAQ = Shared Activities Questionnaire; MDRS = Measure of Disease Related Stigma (adapted version)

Table 7.

*Univariate results of the effects of contact on participants' ratings.*

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	$\eta^2$
Main Effect of Contact	3.16	2	1.58	.92	.40	.01
Two-Way Interactions						
Time by Contact	3.27	2	1.63	2.98	.053	.02
Measure by Contact	91.55	5	18.30	6.96	<.001	.05
Video Condition by Contact	15.56	4	3.89	2.26	.06	.04
Lesson by Contact	4.21	2	2.11	1.23	.30	.01
Three-Way Interactions						
Time by Measure by Contact	3.20	4.68	.68	.68	.46	.01
Time by Video Condition by Contact	1.89	4	.47	.86	.49	.01
Time by Lesson by Contact	.95	2	.47	.87	.42	.01
Measure by Video Condition by Contact	59.74	10.01	5.97	2.27	.01	.04
Measure by Lesson by Contact	9.70	5	1.94	1.94	.60	.01
Lesson by Video Condition by Contact	3.87	4	.97	.56	.69	.01
Four-Way Interactions						
Time by Measure by Video Condition by Contact	3.70	9.36	.40	.54	.85	.01
Time by Measure by Lesson by Contact	4.45	4.68	.95	1.31	.26	.01
Time by Lesson by Video Condition by Contact	.73	4	.18	.33	.86	.01
Measure by Lesson by Video Condition by Contact	42.38	19.01	4.24	1.61	.10	.03
Five-Way Interaction						
Measure by Time by Video Condition by Lesson by Contact	3.80	9.36	.41	.56	.84	.01

Post-hoc analysis was conducted in order to better understand the interaction of measure, contact, and video condition. For the SAQ, participants in the AU condition who reported the highest level of contact provided significantly higher ratings of behavioral intentions than participants who reported a low level of contact ( $p < .01$ ). On average, participants reported overall behavioral intentions toward the student in the AU condition as between “maybe” and “probably” willing to interact across all three levels of contact. Participants in the HFA condition who reported the highest level of contact also provided significantly higher ratings of behavioral intentions than participants who reported a low level of contact ( $p < .05$ ). In this case, participants who reported a high level of contact indicated they were “maybe” to “probably” willing to interact with the target student, whereas participants who reported a low level of contact indicated they were “probably not” to “maybe” willing to interact with the target student. There was no significant difference between participants reporting a high level of contact and a medium level of contact or between participants reporting a medium level of contact and a low level of contact for either the AU or HFA video conditions. For participants in TD video condition, no significant differences were observed as a function of level of contact. Figure 10 depicts participant ratings on the SAQ by video condition and level of contact.

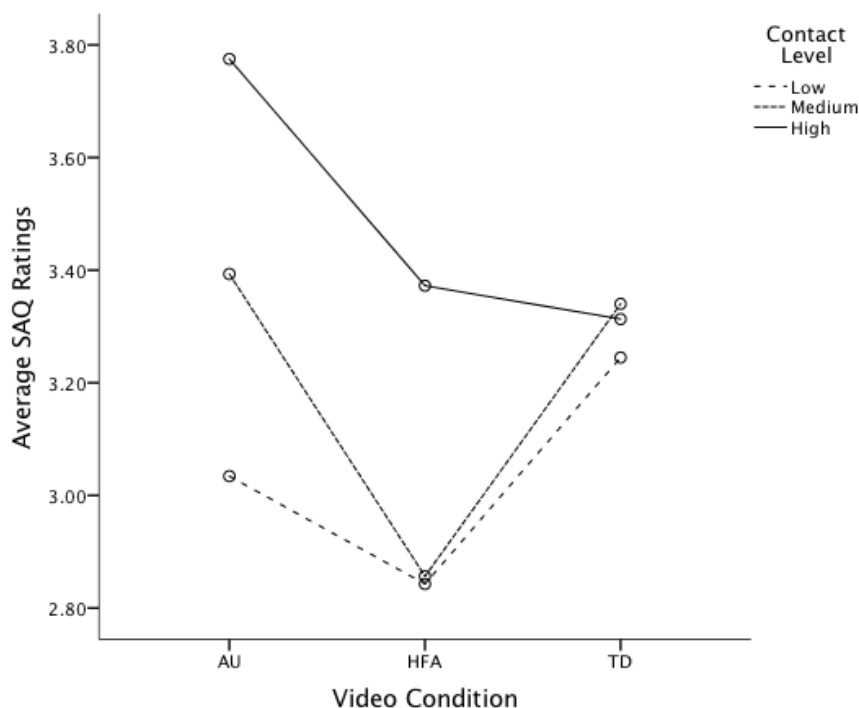


Figure 10. Average SAQ ratings by video condition and level of contact.

On the adapted MDRS Cognitive Attributions subscale, participants in the HFA condition who reported a low level of contact indicated significant higher ratings of cognitive attributions, both as compared to participants who reported a medium level of contact ( $p < .05$ ) and participants who reported a high level of contact ( $p < .05$ ). Participants who reported a medium level of contact did not provide significantly different ratings than participants who reported a high level of contact. On average, participants who reported a low level of contact provided ratings of cognitive attributions (i.e., responsibility/blame) between “neither agree nor disagree” and “somewhat agree” towards the student in the HFA condition, whereas participants who reported a medium and high level of contact provided ratings of between “somewhat disagree” and “neither agree nor disagree.” For the AU condition and the TD condition, no significant differences were observed in Cognitive Attributions as a function of level of contact.

Participants' ratings of Cognitive Attributions by video condition and level of contact is displayed in Figure 11.

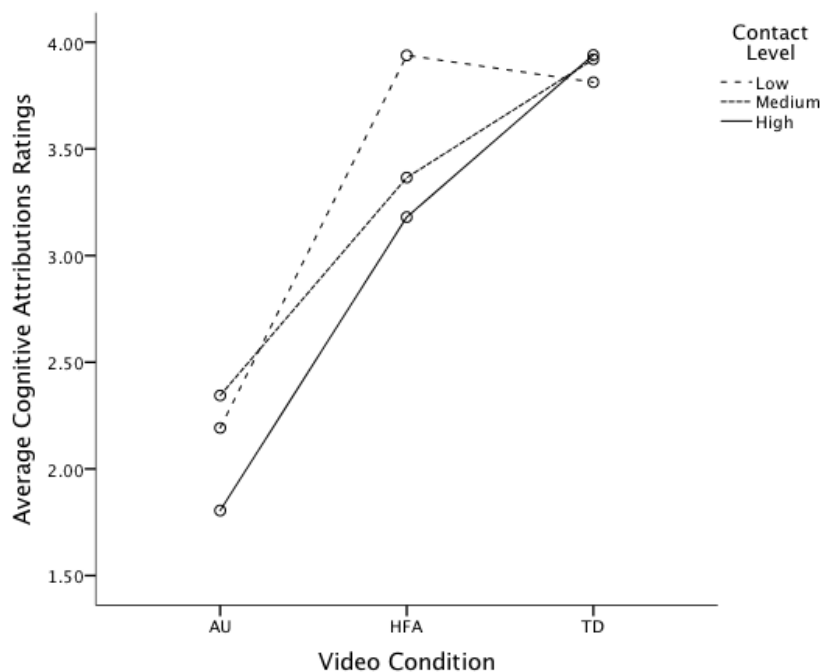


Figure 11. Average Cognitive Attributions ratings by video condition and level of contact.

On the Anger subscale of the adapted MDRS, participants in the AU condition who reported a low level of contact indicated significant higher ratings than participants who reported a high level of contact ( $p < .001$ ). No significant differences were observed for participants who reported a medium level of contact and versus high or low contact in the AU condition. On average, participants who reported a low level of contact indicated they “somewhat disagreed” to “neither agreed nor disagreed” with statements of anger/frustration towards the target student in the AU condition. Participants who reported a medium level of contact indicated they “disagreed” to “somewhat disagreed” and participants who reported a high level of contact indicated they “strongly disagreed” to “disagreed” with statements of anger/frustration on average. For the HFA condition, participants who reported a low level of contact provided

significantly higher ratings, both as compared to participants with a medium level of contact ( $p < .01$ ) and participants with a high level of contact ( $p < .001$ ). Participants in the medium level of contact group and those in the high level of contact group were not significantly different from one another on Anger ratings in the HFA condition. On average, participants who reported a low level of contact indicated they “neither agreed nor disagreed” to “somewhat agreed” with statements of anger/frustration. Participants in the medium level of contact group indicated they “somewhat disagreed” to “neither agreed nor disagreed” and participants in the high level of contact group reported they “disagreed” to “somewhat disagreed” with statements of anger/frustration toward the target student. For the TD condition, no significant differences were observed in Anger ratings as a function of level of contact, with participants at all levels of contact providing ratings that ranged from “strongly disagreeing” to “somewhat disagreeing” with statements of anger/frustration on average. Participants’ ratings on the Anger subscale by video condition and level of contact is displayed in Figure 12.

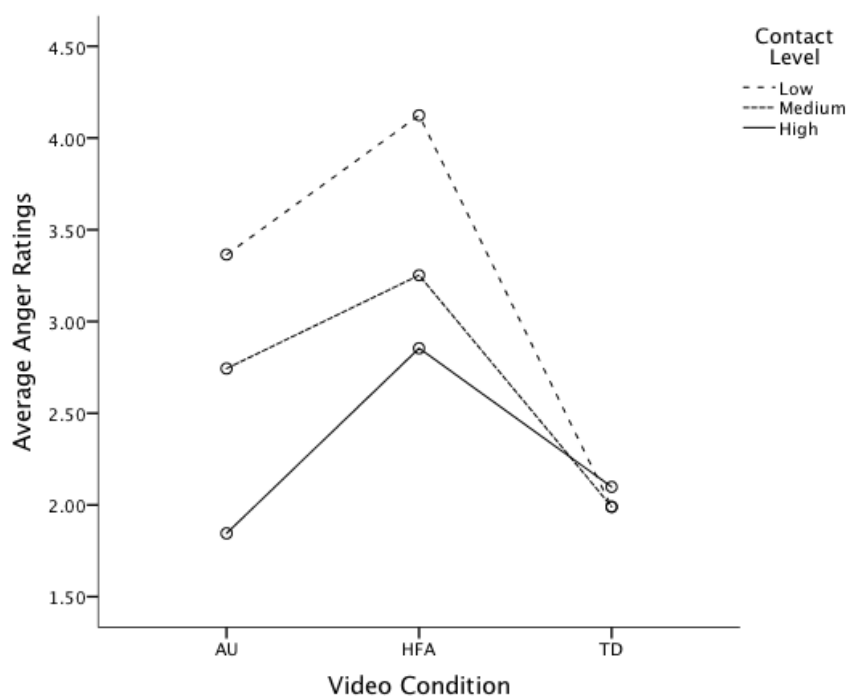


Figure 12. Average Anger subscale ratings by video condition and level of contact.

For the adapted MDRS Sympathy subscale, participants in the AU condition and the TD condition did not provide significantly different ratings as a function of contact level.

Participants in the HFA condition who reported a medium level of contact indicated significantly higher ratings of sympathy than participants who reported a low level of contact ( $p < .05$ ), but no difference in ratings as compared to participants who reported a high level of contact.

Participants who reported a high level of contact did not report significantly different ratings than the other groups. For the AU condition, participants at all three levels of contact indicated they “somewhat agreed” to “agreed” with statements of sympathy toward the target student on average. For the HFA condition, participants at all three levels of contact reported they “neither agreed nor disagreed” to “somewhat agreed” with statements of sympathy toward the target student. For the TD condition, participants at all three levels of contact indicated they “somewhat disagreed” to “neither agreed nor disagreed” with statements of sympathy toward the target student. Figure 13 depicts participant ratings on the Sympathy subscale by video condition and level of contact.

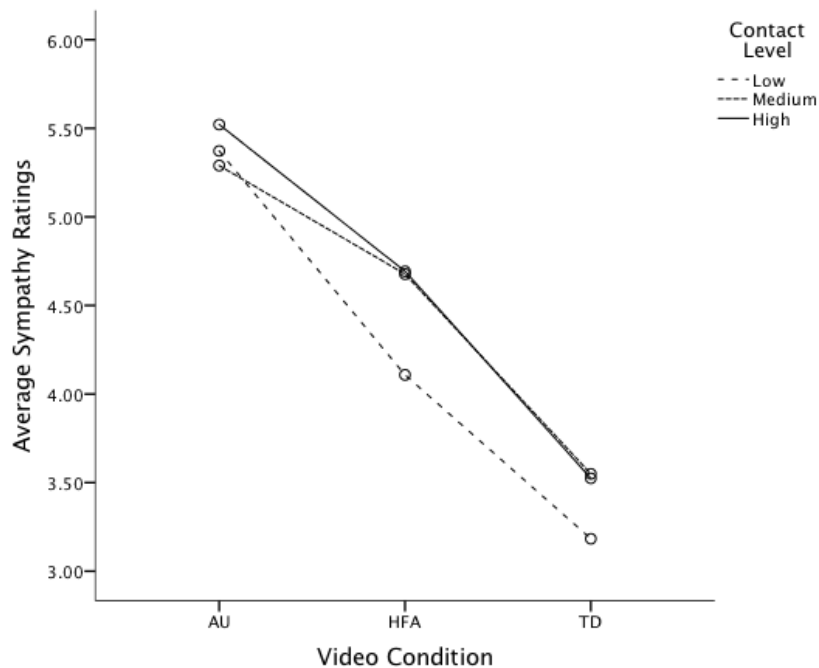


Figure 13. Average Sympathy subscale ratings by video condition and level of contact.

**Gender effects.** A follow-up doubly repeated multivariate analysis of variance was conducted to analyze the behavioral intentions, cognitive attributions, and emotional reactions (anger and sympathy) based on video condition and intervention condition with gender included as an additional independent variable. Results indicated a significant main effect of gender,  $F(1, 260) = 9.57, p = .002, \eta^2 = .04$ . However, no interactions including the variable of gender were significant. On average, male ratings were higher than female ratings. As with the variable of contact, the variable of gender contributed very little to the overall variance of the model (i.e., only 4%). Table 8 shows the overall means of each measure by gender and video condition.

Table 8.

*Means and Standard Deviation of average SAQ ratings (overall), and average MDRS subscale ratings (overall) by gender across condition.*

Condition	AU		HFA		TD		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SAQ	3.39	.79	3.03	.72	3.30	.76	3.17	.77
<i>Gender</i>								
Male	3.28	.80	3.13	.72	3.54	.66	3.32	.74
Female	3.28	.79	2.79	.69	3.00	.76	3.02	.77
MDRS-Cognitive Attributions	2.12	1.05	3.49	1.35	3.90	.91	3.27	1.32
<i>Gender</i>								
Male	2.17	1.09	3.57	1.16	3.98	.94	3.24	1.31
Female	2.23	1.03	3.67	1.51	3.77	.86	3.22	1.35
MDRS-Anger	2.65	1.33	3.43	1.25	2.02	1.04	2.81	1.37
<i>Gender</i>								
Male	2.99	1.45	3.83	1.26	1.99	1.12	2.94	1.47
Female	2.82	1.23	3.41	1.23	2.07	.95	2.77	1.26
MDRS-Sympathy	5.39	1.01	4.51	1.20	3.42	1.00	4.34	1.34
<i>Gender</i>								
Male	5.58	.95	4.45	1.20	3.38	.95	4.47	1.38
Female	5.15	1.04	4.40	1.22	3.40	1.07	4.32	1.32

*Note.* AU = AU (moderate to severe ASD) Video Condition; HFA = HFA (high functioning ASD) video condition; TD = TD (typically developing control) video condition; SAQ = Shared Activities Questionnaire; MDRS = Measure of Disease Related Stigma (adapted version)

To better understand gender effects on participant responses, a follow-up analysis of participant ratings on each measure was conducted. Results indicated that gender only had a significant impact on participants' ratings on the SAQ ( $p = .001$ ). Participants' ratings were not significantly different on the Cognitive Attributions, Anger, or Sympathy subscales as a function of gender. Due to Griffin's (2017) observations of gender effects on participants' ratings of

behavioral intentions, which also varied by SAQ domain, a follow-up multivariate analysis of variance (MANOVA) was conducted to explore gender differences across the three domains of the SAQ – Social, Academic, and Recreational by video condition. Participants’ initial responses on the SAQ (pre-intervention) were used, which permitted a replication and extension of the analysis from Griffin’s study with the inclusion of video condition. Because the effects of time in the final model were small and the lessons did not appear to have a strong or differential effect on participants’ responses, the use of pre-intervention results was considered appropriate. Results indicated significant main effects of video condition and gender as well as a significant interaction of video condition and gender. Table 9 presents the means and standard deviations of participants’ ratings across domains of the SAQ by video condition and gender. Table 10 summarizes the multivariate and univariate effects of gender and video condition across SAQ domains.

Table 9.

*Means and Standard Deviations of average SAQ total and domain ratings across condition and sex at pre-intervention.*

Condition	AU		HFA		TD		<b>Total</b>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SAQ-Total	3.33	.82	2.93	.78	3.36	.81	3.21	.82
Male	3.31	.85	3.15	.76	3.66	.69	3.40	.79
Female	3.34	.80	2.74	.76	3.04	.81	3.03	.82
SAQ-Academic	3.36	.89	3.01	.85	3.48	.77	3.29	.86
Male	3.31	.92	3.16	.86	3.64	.75	3.39	.86
Female	3.42	.87	2.88	.83	3.30	.76	3.19	.85
SAQ-Social	3.46	.87	3.03	.84	3.47	.87	3.32	.88

Table 9 (continued).

Male	3.40	.87	3.28	.82	3.85	.66	3.53	.82
Female	3.52	.87	2.83	.81	3.06	.89	3.12	.89
SAQ-Recreation	3.16	.89	2.74	.89	3.14	.97	3.01	.94
Male	3.24	.92	3.01	.90	3.50	.86	3.27	.91
Female	3.09	.87	2.51	.82	2.74	.94	2.77	.90

*Note.* AU = AU (moderate to severe ASD) Video Condition; HFA = HFA (high functioning ASD) video condition; TD = TD (typically developing control) video condition; SAQ = Shared Activities Questionnaire

Table 10.

*Multivariate and univariate effects of video condition and gender on participants' ratings across SAQ domains.*

	Sum of Squares	<i>df</i>	Mean Square	<i>Wilk's Lambda/F</i>	<i>p</i>	$\eta^2$
<b>All Domains (Multivariate)</b>						
Video Condition	--	6	--	3.06	.006	.03
Gender	--	3	--	8.44	<.001	.09
Video Condition by Gender	--	6	--	3.08	.006	.03
<b>SAQ-Social</b>						
Video Condition	9.71	2	4.86	7.23	.001	.05
Gender	9.33	1	9.33	13.90	<.001	.05
Video Condition by Gender	9.40	2	4.70	7.00	.001	.05
Error	178.67	266	.67			
<b>SAQ-Academic</b>						
Video Condition	10.19	2	5.10	7.39	.001	.05
Gender	1.92	1	1.92	2.78	.10	.01
Video Condition by Gender	2.64	2	1.32	1.92	.15	.01
Error	183.43	266	.69			

Table 10 (continued).

	Sum of Squares	<i>df</i>	Mean Square	<i>Wilk's Lambda/F</i>	<i>p</i>	$\eta^2$
SAQ-Recreational						
Video Condition	8.75	2	4.38	5.60	.004	.04
Gender	14.91	1	14.91	19.06	<.001	.07
Video Condition by Gender	4.23	2	2.12	2.71	.07	.02
Error	208.06	266	.78			

*Note.* SAQ = Shared Activities Questionnaire

Follow-up univariate ANOVA's indicated significant main effects of video condition across domains of the SAQ. However, gender only had a main effect for the Social and Recreational domains. Finally, a significant interaction of video condition and gender was observed for the Social domain only. Post hoc analyses revealed significantly lower ratings of behavioral intentions for females as compared to males across all three domains of the SAQ for the TD condition (Social,  $p < .001$ ; Academic,  $p < .05$ ; Recreational,  $p < .001$ ); for the HFA condition, female ratings were lower than male ratings in the Social ( $p < .01$ ) and Recreational ( $p < .01$ ) domains but not the Academic domain. There were no significant differences between male and female ratings in the AU condition on any SAQ domain. On average, males reported they were "maybe" to "probably" willing to engage with the target student in the AU, HFA, and TD condition in social, academic, and recreational activities. Females reported they were "maybe" to "probably" willing to engage with the student in the AU condition in social, academic, and recreational activities. Female participants indicated they were "probably not" to "maybe" willing to engage with the student in the HFA condition in social, academic, and recreational activities. They were "maybe" to "probably" willing to engage with the student in

the TD condition in social and academic activities, but only “probably not” to “maybe” willing to engage with that same student in recreational activities.

### **Knowledge Gain**

Results of a repeated measures ANOVA with scores on the pre-test and post-test of knowledge about autism as the dependent variable and lesson condition as the independent variable indicate a significant main effect of time,  $F(1, 261) = 5.45, p = .02, \eta^2 = .02$ , but no interaction between time and lesson condition,  $F(1, 261) = .07, p = .79, \eta^2 < .01$ . On average, participants' scores increased from the pre-test ( $M = 9.15, SD = 1.30$ ) to the post-test ( $M = 9.31, SD = 1.14$ ), but this change was minimal (only accounting for 2% of the total variance) and was not uniquely associated with the KfK lesson. Participants' average percentage correct on the pre-test, before the lesson was even conducted, was over 90%, suggesting that, overall, participants had a strong knowledge about ASD prior to the KfK lesson.

### **Mediating Effects**

Results of preliminary correlation analysis indicated that for the AU video condition, Cognitive Attributions were not significantly associated with participants' willingness to interact ( $p > .05$ ). Thus, a mediational analysis was not considered appropriate for this video condition. For the HFA condition, however, Cognitive Attributions, Anger, and behavioral intentions (the SAQ) were significantly related to one another, indicating that a mediational analysis was appropriate to conduct. Next, hierarchical regression was conducted for participants in the HFA video condition with Cognitive Attributions in the first step and the mediating variable of emotional reaction (Anger) in the second step. Cognitive attributions were a significant and negative predictor of behavioral intentions, indicating that the more responsibility and blame participants reported toward the target student with high functioning ASD, the less willing they

were to interact with that student. With the addition of Anger in the second step of the analysis, cognitive attributions were no longer a statistically significant predictor, suggesting that emotional reactions (Anger) mediated the effect of cognitive attributions on behavioral intentions. Results from a follow up Sobel test (1982) indicated that emotional reactions (i.e., Anger) significantly mediated the relationship between cognitive attributions and behavioral intentions ( $t = -2.69, p < .01$ ). Emotional reactions were also a unique and significant predictor, indicating that not only did it mediate the effect of cognitive attributions, but it also uniquely predicted behavioral intentions. Specifically, higher ratings on the Anger subscale were associated with lower ratings on the SAQ – that is, less willingness to interact with the target student. Table 11 shows the bivariate correlations of the cognitive attributions, emotional reactions, and behavioral intentions for each video condition. Table 12 shows the results of the hierarchical regression analyses for the HFA video condition.

Table 11.

*Bivariate correlations of cognitive attributions, emotional reactions (anger), and behavioral intentions.*

	SAQ	Cognitive Attributions	Anger	Sympathy
<i>HFA Video Condition</i>				
SAQ	1			
Cognitive Attributions	-.21*	1		
Anger	-.37***	.47***	1	
Sympathy	.17	-.33**	-.30**	1
<i>AU Video Condition</i>				
SAQ	1			
Cognitive Attributions	.01	1		
Anger	-.57***	.09	1	
Sympathy	.27*	-.33**	-.20	1

*Note.* HFA = HFA (High functioning ASD) video condition; AU = AU (Moderate to severe ASD) video condition; SAQ = Shared Activities Questionnaire (i.e., behavioral intentions)  
 $*p < .05$ ,  $**p < .01$ ,  $***p < .001$

Table 12.

*Tests of the mediating influence of emotional reactions.*

	Variable	$\beta$	$R^2$
Block 1	Cognitive Attributions	-.11*	.04
Block 2	Cognitive Attributions	-.03	.14
	Anger	-.19**	

*Note.*  $R^2$  is the amount of variance attributed to the block of variables.

$*p < .05$ ,  $**p < .01$

### Summary of Significant Effects

Table 13 presents a summary of the significant effects in the primary and follow-up multivariate analyses of participants' ratings.

Table 13.

*Summary of significant effects in primary and follow-up analyses of participants' ratings across measures.*

	Sum of Squares	$df$	Mean Square	$F$	$P$	$\eta^2$
Time	16.30	1	16.30	30.27	<.001	.10
Measure	747.51	2.41	309.76	107.60	<.001	.29
Video Condition	92.36	2	46.18	27.18	<.001	.17
Time by Measure	28.79	2.35	12.26	17.32	<.001	.06
Measure by Video Condition	790.69	4.83	163.83	56.91	<.001	.30
Measure by Lesson	27.82	2.41	11.53	4.00	.013	.02
Video Condition by Lesson	12.97	2	6.49	3.82	.02	.03

Table 13 (continued).

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>P</i>	$\eta^2$
Measure by Video by Lesson	41.09	4.83	8.51	2.96	.013	.02
Measure by Time by Video	17.92	4.70	3.82	5.39	<.001	.04
Measure by Contact	91.55	5	18.30	6.96	<.001	.05
Measure by Video by Contact	59.74	10.01	5.97	2.27	.01	.04
Gender	15.94	1	15.94	9.57	.002	.04

### Discussion

This study offers several insights into the perceptions of middle school peers regarding their fellow students with ASD. Perhaps the most notable result is the significant differences in participants' ratings as a function of video condition and measure with a pattern of ratings that might be expected based on the literature. First, as predicted, participants' ratings indicated the poorest behavioral intentions towards the student in the HFA condition as compared to both the student in the AU condition and the TD condition. As hypothesized, participants were more willing to interact with the student with moderate to severe ASD and the student who appeared typically developing than the student displaying characteristics of high functioning ASD, which replicates the findings of Griffin (2017). In addition, while no hypotheses were specifically generated regarding participants' overall ratings of cognitive attributions and emotional reactions, the literature suggests that people might be more apt to attribute more responsibility/blame towards individuals with more "invisible" or subtle disabilities for their observable behaviors as compared to those individuals with more obvious signs of disability. Relevant theories, such as those presented by Campbell (2006), Corrigan (2000) and Weiner et al. (1988), also indicate that emotional reactions may play a role in behavioral intentions with

higher ratings of anger and lower ratings of sympathy associated with poorer behavioral intentions (see the model depicted in Figure 1). In accordance with this general model, results of this study indicate that participants' ratings of responsibility/blame (cognitive attributions) were significantly lower toward the student in the AU condition as compared to the student in the HFA condition. In terms of emotional reactions, participants reported higher ratings on the Anger subscale and lower ratings on the Sympathy subscale toward the student in the HFA condition as compared to the student in the AU condition, which also aligns with this model. However, the hypothesis regarding the association of cognitive attributions with poorer behavioral intentions and mediated by higher ratings of anger was only supported in part. Regression analysis indicated that, for participants observing and rating the student in the HFA condition, this model did hold true. Higher ratings of controllability/responsibility were significantly associated with poorer behavioral intentions, and emotional reactions (as measured by ratings on the Anger subscale) both mediated this association and significantly and uniquely predicted behavioral intentions (higher ratings on the Anger subscale were associated with less willingness to interact). However, this model was not supported for participants who observed and rated the student in the AU condition.

In terms of specific lesson effects, unique effects related to the targeted psychoeducation for peers about ASD and/or effects specific to the character education program can be examined through analysis of intervention (lesson) effects as a function of time. Alternatively, more general intervention effects, perhaps common to both lessons, might be represented through a general effect of time. Results suggest that neither lesson uniquely impacted participants' ratings across measures. Thus, none of the hypotheses related to the specific lesson effects were supported. Specifically, for peers in the KfK condition, their behavioral intentions did not

uniquely improve toward the student in the HFA condition, nor did their cognitive attributions and emotional reactions change uniquely; for the character education lesson, improvements in behavioral intentions were not observed broadly across all three groups. However, there was a significant effect of time that varied by measure and video condition, which suggests that both interventions may have had a dispersed effect on participants' ratings. Changes in behavioral intentions were not generally in the expected direction, with participants reporting less willingness to interact with the target student in the AU and TD condition over time. Of note, ratings toward the HFA condition increased (though not a significant amount). Ratings of cognitive attributions (that is, statements of blame/responsibility towards the target student regarding behaviors he exhibited) changed in a way for which it might be hoped, taken with the proposed model (see Figure 1) – that is, cognitive attributions decreased significantly for all three video conditions. Ratings of emotional reactions only changed in an expected way (see Figure 1) for the HFA condition. That is, ratings on the Anger subscale decreased significantly and ratings on the Sympathy subscale increased significantly, but only for the HFA condition. Overall, a pattern of unique effects emerged in terms of change over time in ratings for the HFA condition, but this change was not associated with one lesson or the other. These results indicate potential evidence that both lessons equally and positively affected participants' perceptions of the target student with characteristics of high functioning ASD. As students with high functioning ASD might be considered more socially vulnerable (for example, see the results of bullying research described by Zablotsky et al. 2014), this suggests that some type of intervention, whether ASD-specific or general, may be uniquely helpful for changing perceptions of peers towards students with more subtle symptoms of ASD.

In terms of the change in participants' ratings over time, it is important to acknowledge two issues. First, the change over time only accounted for a small portion of the overall variance, indicating that this change, though significant, was small. Second, it is important to make a distinction between statistically significant and clinically significant change when considering these results. While it is interesting that ratings did change in the expected direction for some measures (most notably towards the student in the HFA condition), at times, a "significant" change still involved an average score that fell within the same category. For example, though ratings decreased significantly for the AU and TD condition on the SAQ, participants' ratings fell within the range of "maybe" to "probably" willing to interact with the target student at both pre and post-intervention; on the Anger subscale, ratings decreased significantly for the HFA condition, but participants' ratings fell between "somewhat disagreed" to "neither agreed nor disagreed" with statements of anger/frustration at both pre and post-intervention. Thus, while the change is interesting, the clinical impact is limited in scope. Other changes perhaps carried more weight. For example, prior to the intervention, participants' cognitive attributions fell within a range that included endorsing statements of controllability/blame (i.e., "neither agreed nor disagreed" to "agreed") in the HFA and TD condition, whereas after the intervention, participants' ratings fell within a different range that less clearly endorsed such statements on average (i.e., "somewhat disagreed" to "neither agreed nor disagreed").

Another insight provided by this study is the investigation of the variable of contact. The more detailed rating scale created and used for this study provided a more nuanced exploration of peers' prior experiences with individuals with ASD. The majority of participants (over 80%) reported some level of direct contact with a person with ASD, but this contact ranged greatly

across the response categories, from “rarely” (e.g., observed a person in passing) to “almost always” (e.g., live with that person). In addition, the effects of contact on participants’ ratings followed an interesting general pattern which suggests that higher levels of contact potentially serve to mitigate negative perceptions towards individuals with ASD. First, it was hypothesized that higher rates of contact would be associated with higher behavioral intentions towards the target student in either ASD condition, and the results support this prediction. In addition, these participants who reported higher levels of contact also reported lower ratings of cognitive attributions (less blame/responsibility) towards the student in the HFA condition and they reported lower scores on the Anger subscale for both the AU and HFA condition. The effects of contact on the variable of sympathy were less clear; the only significant difference was for participants who reported a medium level of contact, and their ratings on the Sympathy subscale were lower than participants in the other groups. Contact did not significantly impact the effects of the lessons, nor did it significantly affect how participants’ ratings changed over time. Though interesting, it is important to note that the variable of contact had only a small effect (accounting for just 4% of the variance in the model).

This study also follows up on a question regarding sex/gender differences that emerged in Griffin’s (2017) initial analysis. Sex had no effect in the overall multivariate analysis; however, follow-up analysis of participants’ responses at pre-intervention revealed interesting insights into sex differences across video condition based on the domain of the described activity on the SAQ (i.e., Social, Academic, or Recreational). Female participants were less willing than their male counterparts to interact with the student in the TD condition across domains. However, female participants’ ratings were only lower than males’ ratings in the Social and Recreational domain for the HFA condition. For the AU condition, female and male ratings were commensurate.

While some researchers have observed that females demonstrate more positive attitudes than males towards individuals with disabilities (see Rosenbaum, Armstrong, & King, 1988; Townsend, Wilton, & Vakilirad, 1993), and specifically towards a student with ASD (Campbell, 2007), these results suggest a different pattern that is similar to the results observed by Campbell et al. (2004), in which male participants' behavioral intentions were higher than female participants toward the typically developing male target student but commensurate with female participants when rating a male target student presenting with moderate to severe ASD. It may be that, as Griffin (2017) noted, engaging in the types of activities described in the SAQ carries a different meaning for middle school-age females. Positive responses on the SAQ may be perceived as suggestive of interest in a non-platonic relationship with the depicted typically developing male student. For the male student with more subtle characteristics (that is, the HFA condition), these sex differences were similarly observed, but only for the non-academic activities. However, sex differences did not carry over to participants' behavioral intentions towards the male student with moderate to severe characteristics of ASD. While Griffin (2017) proposed that it may be important to consider the sex of peers selected for peer interventions, these results suggest that this consideration may be of limited importance in interventions for students with moderate to severe ASD; caution in identifying peers for support may only be warranted when working with students with high functioning ASD, and may be of less concern when interventions are academically based. Still, as with some of the other variables explored, these sex differences accounted for only a small amount of the total variance.

### **Additional Implications for Practitioners**

The significant changes in ratings over time suggests that both lessons may have had some effects (though small), suggesting that some type of class-wide peer education program

may be valuable for educators to consider when trying to support students with ASD. In particular, a class-wide intervention such as the lessons used in this study may be warranted when working with students with high functioning ASD. However, results indicate that it may not be necessary to uniquely target ASD in such psychoeducational interventions. For students and families who wish to preserve the confidentiality of their diagnosis, these results provide an alternative option – specifically, incorporating broader-based character education into intervention efforts rather than talking to peers specifically about ASD may be equally as effective. Indeed, responses on the pre/post-test of knowledge about ASD suggests that, on average, peers may already possess an adequate basic understanding about ASD.

Another implication of these findings is that peer interventions may be more beneficial when focused on creating opportunities to for peers to interact with students with ASD and providing peers with strategies to facilitate positive and successful interactions. While the variable of contact only had a small effect, the results indicate that peers who have higher levels of contact with someone with ASD may be more willing to interact with a student with ASD. As peer-mediated interventions have already been identified as an evidence-based practice (e.g., see Carter et al., 2014), finding ways to increase and facilitate positive interactions and engagement between students with ASD and their peers may be the most important place for educators to focus their efforts.

### **Limitations and Future Directions**

One limitation of this study is that the design precluded an investigation of immediate effects as compared to effects after some time had passed. Though effects that maintain over time are considered more important, it might have been interesting to analyze any immediate changes in students' perceptions after the lesson. One reason for looking at effects after time had

passed was to control for participants' awareness of what the researcher was attempting to investigate suggesting "demand characteristics" could be a threat to internal validity (see Orne, 1962), though it is still possible that some participants were able to infer the study purpose, which may have impacted their responses. Even so, significant differences in participants' responses were still observed that indicated less willingness to interact with the student with high functioning ASD, and these differences persisted, even in the face of potential pressures imposed by awareness of what the investigator was attempting to achieve and/or the need to provide more socially desirable responses. Thus, results of this study do seem to support the notion that students with high functioning ASD may be uniquely vulnerable in the social arena. Results of this study suggest that a broad-based character education lesson and an ASD-specific lesson may have equally impacted participants' responses over time. However, to ensure that no other factors impacted the change in participants' responses over time, future research might include a third condition such as a waitlist control.

Though this study offers a novel perspective of peer perceptions towards students with ASD in terms of the constructs (cognitive attributions and emotional reactions) and model explored, it is important to consider the limitations of this study in exploring this model. First, the model originally proposed by Weiner (1988) and adapted by Corrigan (2000) is largely focused on behavioral reactions related to helping or punishing. This study takes this model a step further (e.g., Campbell et al., 2004) to include behavioral intentions to socially interact for other purposes (i.e., academic, social, and recreational purposes). However, it may be that this type of interaction does not fit as well within the originally proposed model, as making a decision about whether or not to help a person may be a very different process than making a decision about whether or not to interact and engage with a person in various activities. Second,

the model investigated implies a causal relationship (cognitive attributions leading to emotional reactions that thereby impact behavioral intentions). However, this study was not designed to capture a true causal relationship, as indicated in this model. Future studies might address these issues in part by having participants complete measures in a sequence relevant to the given model (i.e., rate cognitive attributions, then emotional reactions, and then behavioral intentions). In addition, an experiment designed to fully explore this model could include manipulations at different stages. For example, a manipulation of emotional reactions might be incorporated to increase sympathy or increase frustration (e.g., by having participants complete an activity to highlight any feelings of sympathy or any feelings of frustration) prior to completing a measure of behavioral intentions. Finally, incorporating items or measures related to help-giving behavior into examinations of behavioral intentions might be useful to further differentiate the types of behaviors in which participants would be willing to engage.

While understanding peer perceptions in general may promote better understanding and intervention planning, the primary goal of this study was to specifically investigate the effects of an intervention designed to improve peer understanding of ASD (i.e., the KfK lesson), and results suggest this lesson was not uniquely effective. The KfK intervention teaches about students with ASD more broadly using a hypothetical example of a student with ASD. However, as has been noted previously, the spectrum of autism is quite diverse and includes a range of individuals who demonstrate strengths and areas of difficulty that can vary widely. One option to consider for future research is that an ASD-specific lesson may be more effective by teaching peers about a specific student with his or her unique constellation of skills and behaviors, rather than addressing these skills more broadly. Alternatively, a general ASD lesson such as the KfK might still be used, possibly with some minor adaptation specific to a target student, but the

effects on peers' perceptions towards an actual, familiar student with ASD in their classroom might be explored (cf. rather than using a video vignette). In addition, actual social interactions of peers with a student with ASD in their class could be monitored for change rather than just collecting information about peers' behavioral intentions. Though changing peers' perceptions may be valuable, ultimately, the goal of educators should be to implement interventions that effect actual change in the day-to-day lives of students with ASD.

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**APPENDICES**

## Appendix A

### Appendix A. Shared Activities Questionnaire

#### SAQ

**Here is a list of things that you might do with Robby. Circle the answer that shows how you feel about doing each of these things with Robby.**

1. Ask Robby to come to my house to watch TV.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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2. Sit next to Robby in class.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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3. Work in the school library with Robby.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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4. Share my games or books with Robby.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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5. Work on a science project at school with Robby.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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6. Be in the same reading group with Robby.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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7. Study for a test with Robby at school.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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8. Invite Robby to my birthday party.

<b>No, Definitely Not</b>	<b>Probably Not</b>	<b>Maybe</b>	<b>Probably</b>	<b>Yes, Definitely</b>
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9. Ask Robby to go to an amusement park with me, like Six Flags.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

10. Go out to dinner with Robby and his/her family.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

11. Eat lunch next to Robby at school.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

12. Walk together with Robby in the hall at school.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

13. Do art with Robby in class.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

14. Go shopping at a store with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

15. Work math problems in class with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

16. Write a story or report for school with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

17. Ask Robby to join my group of friends.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

18. Do homework with Robby at home after school.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

19. Go to the movies with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

20. Play with Robby outside at school.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

21. Pick Robby as my partner in a game with other kids.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

22. Be good friends with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

23. Go to a ball game with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

24. Go to McDonald's with Robby.

**No, Definitely Not**      **Probably Not**      **Maybe**      **Probably**      **Yes, Definitely**

## Appendix B

### Appendix B. Modified CARS

#### I. GETTING ALONG WITH PEOPLE

1. No problems getting along with people; about the same as other kids that age
2. May occasionally have trouble looking people in the eye, be especially shy, might not respond to others as much as someone normally would
3. Sometimes doesn't seem aware of others; it's hard for others to get this child's attention, doesn't try to interact with others very often
4. Almost always seems not aware or not interested in what others are doing. Almost never responds or tries to interact with others, really hard to get this child's attention

#### II. SHOWING FEELINGS AND EMOTIONS

1. No problems showing feelings and handling feelings like most other kids
2. Occasionally has difficulty showing feelings and emotions - might occasionally have too big or small of a reaction/feeling; might occasionally show feelings that don't seem related to things going on around the child
3. Seems to have difficulty showing feelings and emotions several times - might have too big or small of a reaction/feelings several times, might seem to have feelings and reactions that don't seem related to what's going on around the child several times
4. Almost never seems to show appropriate feelings or handle feelings appropriately; if the child gets in a certain mood, it might be really hard to change that mood, or the child's mood might change a lot even though it doesn't seem like there's anything going on that is related

#### III. ABILITY TO MOVE AND HANDLE BODY MOVEMENTS

1. No problems moving around and being coordinated like most other kids
2. Might have just a few problems moving around/being coordinated like others; might be a little clumsy; might have just a few odd body movements that seem unusual
3. Might have several strange or unusual body movements or might do these movements sometimes (like strange finger movements, rocking, spinning around, walking on toes)
4. Has a lot of unusual body movements or does these movements a lot; even if others try to get the child to stop these movements might continue

#### IV. USING TOYS AND OTHER OBJECTS

1. Seems to have a normal interest in toys and other objects like other kids that age
2. Just a few problems with using toys and other objects like normal; might be interested in toys or objects in a way that seems a little unusual or childish (like banging the toy or sucking on it)
3. Several problems with toys and other objects – either doesn't seem very interested in toys like others that age, or might be interested in the toy in an unusual way – for example, focusing on a part of the toy that doesn't seem very important, being interested in the way light reflects off the object, moving the object around the same way over and over, or only playing with one toy or object all of the time

4. A lot of problem with toys and other objects (even more often or in a more intense way than described above); it's really difficult to distract the child when playing with the toy or object of interest

#### **V. HANDLING CHANGE**

1. No problems handling change – not too stressed over change
2. When an adult tries to change the activity the child might continue the same activity or use the same materials
3. The child has more problems with changes in the routine; might try to continue the same activity, might be difficult to distract, might become angry or unhappy when the routine changes
4. Has a lot of problems with change – might have a severe reaction when there is a change; if the change is forced, the child might become really angry or won't listen and follow directions, might have a tantrum

#### **VI. LOOKING AT THINGS**

1. No problems with looking at things/using sense of sight
2. Occasionally needs reminders to look at objects; just occasionally may stare off into space or may avoid looking others in the eye
3. Frequently must be reminded to look at what he or she is doing; may frequently stare into space, avoid looking people in the eye; may frequently look at objects from an unusual angle or hold objects very close to eyes while looking
4. Consistently avoids looking at other people or certain objects; may always avoid eye contact or show extremely unusual ways of looking at objects (looking at things from unusual angle or up really close)

#### **VII. LISTENING TO THINGS**

1. No problems with listening to things/using sense of hearing
2. Occasionally has some lack of response to sounds or mild overreaction to some sounds; may not respond right away (some delay before responding); may be distracted by sounds
3. Response to sound varies; often ignores a sound the first few times; may be startled or cover ears when hearing everyday sounds
4. Extreme overreaction and/or under-reaction to sounds, regardless of type of sound

#### **VIII. TASTE, SMELL, AND TOUCH RESPONSE AND USE**

1. Explores new objects like other kids the same age (usually just feeling and looking; tasting or smelling when appropriate)
2. Puts objects in mouth, tastes or smells when not really appropriate
3. May be somewhat unusually interested in touching, smelling, or tasting objects or people
4. Seems to be very unusually interested in touching, smelling, or tasting objects – more for the sensation

**IX. TALKING/COMMUNICATING**

1. Talks to other people like other kids the same age
2. Some talking seems a little slower than normal; may occasionally repeat what others say; occasionally uses odd words or has slightly unusual way of saying things
3. May not talk very much; talking may include frequently copying what someone else says; may ask questions excessively or just talk about one topic over and over
4. Does not seem to talk/use regular speech; may make sounds or squeals; may make noises that sound like talking but aren't real words, or might use some words or phrases in an unusual way that is hard to understand

**X. BODY LANGUAGE/FACIAL EXPRESSIONS**

1. Uses body language and facial expressions like other kids the same age
2. May not use as much body language or facial expressions as others – may not use pointing and gesturing to specifically show what wants
3. Has difficulty asking for and showing needs using body language and facial expressions and has trouble understanding body language and facial expressions of others
4. Only uses odd gestures that don't seem to have meaning and doesn't seem to understand gestures or facial expressions of others

**XI. ACTIVITY LEVEL**

1. Seems as active as other kids the same age
2. Seems mildly over or under-active – may be restless or slow moving at times
3. May be frequently over-active, have lots of energy, and be difficult to calm down; on the other hand, may seem slow and tired and might need lots of prompting to get moving and do things
4. Shows extremes of activity or inactivity and may switch from one extreme to the other

## Appendix C

### Appendix C. KfK Pre/Post Test

- T F 1. Autism affects a person's brain
- T F 2. You can catch autism by spending time with someone who has it, like you can catch a cold.
- T F 3. All kids with autism are the same
- T F 4. Even though some kids with autism might seem like they don't want to play, this does not mean they don't want friends
- T F 5. Kids with autism might not look at you in the eyes when they are talking to you
- T F 6. Some kids with autism might rock back and forth or flap their hands
- T F 7. Kids with autism do not have any problems with their senses
- T F 8. If I have a friend with autism who talks about just one thing over and over, it is still okay for me to suggest something I want to do, too.
- T F 9. If a person with autism isn't looking at me, then that person is probably ignoring me.
- T F 10. Sometimes kids with autism need extra help in school.

## Appendix D

### Appendix D. Adapted Measure of Disease-Related Stigma (MDRS) Items by Subscale.

Rate on Likert Scale: 1 (strongly disagree) to 7 (strongly agree)

#### Subscale 1: Cognitive Attributions

- Robby could have avoided the way he acted and interacted with others
- It is something that Robby did that caused him to act and interact with others like he did
- Robby chose the behavior that caused him to interact with others like he did
- Robby is responsible for the way he acted and interacted with others
- Robby could have done more to prevent the way he acted and interacted with others
- Robby only has himself to blame for the way he acted and interacted with others
- It is Robby's own fault that he acts and interacts with others the way he does
- Robby's behavior and interactions with others are due to a mistake he made.

#### Subscale 2: Anger/Frustration

- Robby's behavior is frustrating
- Robby makes me feel irritated
- I feel aggravated by Robby

#### Subscale 3: Sympathy

- I feel sadness for Robby
- I feel sympathy for Robby
- I do not feel sorry for Robby
- I have no compassion for Robby

## Appendix E

### Appendix E. Level of Contact

How much have you been around someone with autism?

- 1 Not at all  
(eg: I have never observed a person I was aware had autism)
  
- 2 Almost not at all  
(eg: I watched a movie or television show in which a character depicted a person with autism)
  
- 3 Rarely  
(eg: I've observed a person in passing who had autism)
  
- 4 Occasionally  
(eg: I have observed other people with autism on a frequent basis)
  
- 5 Sometimes  
(eg: I have worked with another student at school who has autism)
  
- 6 Often  
(eg: I have a friend or know a friend of the family who has autism)
  
- 7 Very often  
(eg: I have a close relative who has autism)
  
- 8 Almost always  
(eg: I live with a person who has autism)

## Appendix F

### Appendix F. Procedural Reliability Checklist-KfK

Steps from Lesson Plan	Performed [Check (√) if performed]
1. Passes out fold out handouts.	
2. Reads introduction from Lesson plan	
3. Reads cover title and paragraph.	
4. Asks – What do you think she means by different?	
5. Reads Page 1 of fold out book.	
6. Asks – What are some things different about Nick?	
7. Asks—Are we all the same? Do some of us get to do different things in class?	
8. Reads page 2 of fold out book.	
9. Asks — What is autism?	
10. Reads/Asks—Nick learns things in a different way. Do we all learn in the same way, or sometimes in different ways?	
11. Asks—Can you catch autism?	
12. Reads page 3 of fold out book.	
13. Asks—Are all kids with autism the same?	
14. Asks—What are some things you might see someone with autism do?	
15. Asks—What are some things you might do to make yourself comfortable?	
16. Reads page 4 of fold out book.	
17. Asks—What are some other things someone with autism might do?	
18. Asks - What are some things you like to do?	
19. Reads page 5 of fold out book.	
20. Asks—Is autism scary?	
21. Asks—Is someone with autism a person just like me or you?	
22. Reads page 6 of fold out book.	
23. Asks—What are some things you like to change around you to help you to focus?	
24. Reads page 7 of fold out book.	
25. Asks—Is it ok for some people to need more help than others?	
26. Asks—Can we be friends with someone with autism?	
27. Lesson plan conclusion. Reads 3 boxes from the chart.	
28. Says “Autism isn’t something to be scared of. Everyone is different and people with autism are just like everyone else.”	
Number Correct	
Percent Correct	

Procedural Reliability Score: \_\_\_\_\_%

## Appendix G

### Appendix G. Character Education Lesson and Checklist

#### Part 1: Connection to People

- A. Discuss the quote: “No man is an island unto himself,” penned by the English poet and clergyman John Donne
- a. Questions for discussion:
    - i. What do you think he meant?
    - ii. In what ways are we connected to other people?
  - b. Key Concept: All people are connected**
- B. Tell students that there are also different needs we have from one another, and these needs are different at different stages in our life. For example, babies need other people to completely provide their basic physical needs for food, clothing and shelter. Name the following age groups and discuss the question: What does this age group need from other people?
- a. Age groups:
    - i. Toddler
    - ii. Elementary school age
    - iii. Middle School
    - iv. High School
    - v. College
    - vi. Career/Parent
    - vii. Retired/Old
  - b. Key Concept: We need healthy relationships with other people to help us stay healthy in different ways across our life span**

#### Part 2: Similarities and Differences

- A. Tell students that even though we are connected, we have ways we are similar to and different from one another. Read the list of statements and ask students to stand if the statement applies to them:
- a. I am an only child
  - b. I like to play sports
  - c. I like pizza
  - d. I have travelled out of this state before
  - e. I am in \_ grade [list the grade students should be in]
  - f. My parents were born in this country
  - g. I attend \_ school [list the students’ current school]
  - h. I am good at science
  - i. I do not like ice cream
  - j. I like rap music
  - k. I am good at math
  - l. I like to read
  - m. I am tall for my age
  - n. I like rock music
  - o. I live in \_ [list the city where most students live]

- B. Show students the optical illusion of old woman/young woman and ask students what they see. Have students stand if they saw the old woman first and stand if they saw the young lady first. Point out to students that this is another way we can be different or the same – the perspective we have about things
- C. **Key concept: We all have ways we are alike and ways we are different; things we are good at, and things that are hard for us; even ways we perceive the world differently**

### Part 3: Diversity

- A. Ask students if they have ever been teased or made fun of by someone. Discuss with students that sometimes we might even be made of fun of for some of the ways we are different or similar to others. Read the list of categories and ask students to stand if they have ever been teased or made fun of for something in that category:
- a. your height, weight, body size or a body part
  - b. the clothes you wear, your hair, your jewelry
  - c. where you live
  - d. the color of your skin
  - e. your intelligence or classes you are (were) in
  - f. having glasses, a hearing aid, or braces
  - g. the music you listen to or the things you like to do
  - h. your beliefs
- B. Discussion questions:
- a. What would it be like if everyone looked the same and had the same interests?
  - b. Why do people make fun of others who are different from them?
  - c. How can meeting someone who is different from you make your life better?
  - d. Name something you have learned by being with someone who was different from you
- C. **Key concept: Diversity adds value to our lives, and we should strive to be more accepting of others around us**
- D. Summarize the connection among key concepts: People are connected and we rely on one another. We have ways we are similar but also have many differences, which adds value to our lives.

Developed from the following resources:

- Lesson plans and corresponding links posted on the West Virginia Department of Education website; reportedly developed by Shauna Jones, WV Children's Home School (2009)
- Activities described in the South Carolina Department of Education *Character Education Toolkit*
- Activities described in a lesson plan provided by a current middle school counselor

## Procedural Reliability Checklist-Character Education

Steps from Lesson Plan	Performed [Check (√) if performed]
1. Reads quote to class: “No man is an island unto himself”	
2. Asks - What do you think he meant?	
3. Asks - In what ways are we connected to other people?	
4. States key concept – All people are connected	
5. States, “There are also different needs we have from one another, and these needs are different at different stages in our life. For example, babies need other people to completely provide their basic physical needs for food, clothing and shelter.”	
6. Reads age groups and asks – What does this age group need from other people?	
7. States key concept – We need healthy relationships with other people to help us stay healthy in different ways across our life span	
8. States, “even though we are connected, we have ways we are similar to and different from one another”	
9. Reads the list of statements and asks – Stand if the statement applies to you	
10. Shows optical illusion and asks – What do you see?	
11. States key concept – We all have ways we are alike and ways we are different; things we are good at, and things that are hard for us; even ways we perceive the world differently	
12. Ask – Have you ever been teased or made fun of by someone?	
13. Reads the list of categories and asks – Stand if you have ever been teased or made fun of for something in this category	
14. Asks – What would it be like if everyone looked the same and had the same interests?	
15. Asks— Why do people make fun of others who are different from them?	
16. Asks – How can meeting someone who is different from you make your life better?	
17. Ask – Name something you have learned by being with someone who was different from you	
18. States key concept – Diversity adds value to our lives, and we should strive to be more accepting of others around us	
19. Summarize connection among key concepts – People are connected and we rely on one another. We have ways we are similar but also have many differences, which adds value to our lives.	
Number Correct	
Percent Correct	
Procedural Reliability Score: _____%	