ABSTRACT

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Although changes in the selection and effectiveness of emotion regulation are often theorized to be a function of changes in motivation due to shifts in time perspective in later life, there is little empirical evidence examining the relationship between future time perspective, intrinsic motivation, and emotion regulation directly. The present study addressed this gap by implementing an emotion regulation task on Amazon's Mechanical Turk (MTurk; n = 178, 20 - 88 years) to assess age differences in strategy selection and effectiveness of emotion regulation. Motivation, but not future time perspective, was found to mediate the relationship between age and perceived effectiveness, actual effectiveness, and emotion regulation strategy selection. That is, older age was associated with more motivation and in turn, was associated with greater perceived effectiveness, worse actual effectiveness for the emotion regulation task, and less use of disengaging emotion regulation strategies. Additionally, a more expansive future time perspective was associated with greater effort on the emotion regulation task and more internally driven motivation to down regulate one's negative emotions, opposite of the expectations of socioemotional selectivity theory. These findings have implications regarding the underlying mechanisms, specifically future time perspective, which are suggested to drive socioemotional changes in later life.

Tuned Emotions: How Age, Intrinsic Motivation, and Time Perspective Impact the Selection and Effectiveness of Emotion Regulation

by
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DEDICATION

To my parents, Homayoun and Sima Sharifian. Without their support, I would not be the person I am today.

BIOGRAPHY

Neika Sharifian graduated from NC State University with a B.A. in Psychology in 2013. After the completion of her undergraduate studies, she continued her education by attending graduate school at NC State University with Dr. Daniel Grühn in the Adult Cognition and Emotion Lab. Neika received her M.S. in Lifespan Developmental Psychology in 2015. Her master's thesis examined what aspects of an emotional experience impact the retrospective evaluation of affect. Neika's doctoral research examined age differences in emotion regulation effectiveness and strategy selection. Specifically, she examined what were the underlying mechanisms behind age differences in emotion regulation.

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Introduction

Older adults, compared to younger adults, report better emotional functioning. For example, older adults report higher life satisfaction (Mroczek & Sprio, 2005), fewer depressive symptoms (Goldberg, Breckenridge, & Sheikh, 2003), lower negative affect and higher positive affect (Charles, Reynolds, & Gatz, 2001) than younger adults. These increases in socioemotional well-being are thought to be a function of more effective emotion regulation in later life (Charles & Carstensen, 2010), such as greater emotional control (i.e., Gross et al., 1997; Lawton, Kleban, Rajagopal, & Dean, 1992) and more effective implementation of emotion regulation strategies compared to young adults. For instance, older adults have reported greater maintenance of well-being when using positive reappraisal (i.e., reinterpreting an event in a more positive light; Popham & Hess, 2014), positive refocusing (i.e., replacing negative emotions with more positive ones; Phillip, Henry, Hosie & Milnie, 2008), expression suppression (i.e., hiding behavioral expressions of emotion; Phillip et al., 2008), and avoidance during negative social discourses (i.e., avoiding an argument; Charles, Piazza, Luong, & Almeida, 2009) relative to younger adults.

Age-related shifts in motivation have been theorized to play a key role in maintaining well-being in later life. In particular, socioemotional selectivity theory (SST; Carstensen, Isaacowitz, & Charles, 1999) states that perception of time left in life influences goal selection. When time horizons are perceived as limited, motivation shifts to an increased focus on emotion-oriented goals, which is argued to lead to better emotion regulation, and subsequently better emotional well-being (Carstensen et al., 1999). When time horizons are perceived as expansive, the theory predicts that persons focus on knowledge-oriented goals

such as their career or meeting novel social partners (Fredrickson & Carstensen, 1990). These shifts in motivation due to shifts in future time perspective have been suggested to be the underlying mechanism behind age differences in the selection of emotion regulation strategies (i.e., Martins, Sheppes, Gross, & Mather, 2016) and age differences in emotional well-being (i.e., Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles et al., 2001).

Despite the theoretical notion based on SST (Carstensen et al., 1999) that having a limited future time perspective leads to positive changes in socioemotional functioning, a limited future time perspective has been empirically linked to a more maladaptive emotional profile. For instance, a more limited future time perspective was associated with higher negative affect, more depressive symptoms, lower life satisfaction, lower positive affect, lower empathy, lower positive emotions, and lower motivation to experience joy (Grühn, Sharifian, & Chu, 2016). A more limited future time perspective also mediated the relationship between age-related losses and psychological well-being. That is, higher perceived age-related losses predicted a more limited future time perspective which subsequently predicted lower psychological well-being (Brothers, Gabrian, Wahl, & Diehl, 2016). Similarly, a more expansive time perspective within the workplace was associated with greater workplace well-being such as work-related aspirations and engagement (Kooji, de Lange, Jansen, & Dikkers, 2013).

Consistent with the link between time perception and well-being, viewing time as more limited may also lead to suboptimal emotion regulation. For example, when measuring self-reported up and down regulation of affect using the Action Control Scale (Kuhl & Beckmann, 1994), Kessler and Staudinger (2009) found that a more expansive time

perspective was associated with higher self-reported efficiency of down-regulating negative emotions after experiencing a failure, which is opposite of expectations of socioemotional selectivity theory. This finding contrasts with the idea that changes in time perspective lead to enhancements in emotion regulation in older adulthood (e.g., Charles & Carstensen, 2010).

Motivation is also argued to be an important mechanism behind age differences in maintaining emotional well-being and is theorized to be linked to future time perspective (Reed & Carstensen, 2012). Specifically, socioemotional selectivity theory theorizes that a more limited future time perspective shifts focus from knowledge-focused towards emotion-focused goals (Carstensen et al., 1999). This shift is theorized to lead to more motivation to maintain one's emotional well-being and is frequently cited as evidence for age differences in emotion regulation and well-being (e.g., Carstensen, Fung & Charles, 2003). However, there are few empirical investigations examining how age and future time perspective influence motivation to maintain one's emotional well-being. Rather, changes in preference for familiar over novel social partners (Fredrickson & Carstensen, 1990), gaze preference for positive over negative information (Isaacowitz, 2006), and preference for emotion-focused content over information-focused content (Fung & Carstensen, 2003) have all been used to infer greater intrinsic motivation to optimize emotional well-being. Similarly, experimental manipulations of perceived endings have been used to infer the relationship between perceptions of time left and motivation. For example, Carstensen and colleagues (Fredrickson & Carstensen, 1990; Fung & Carstensen, 2004; Fung, Carstensen & Lutz, 1999) manipulated motivation by altering perceptions of time left (i.e., limited, expansive) and had participants identify their social partner preferences. The researchers found that older adults

with no manipulation tended to select familiar over novel social partners whereas younger adults demonstrated the inverse. When time was manipulated to be more limited, both younger and older adults selected familiar over novel social partners. This was used to infer that older adults perceive their time as more limited which leads to greater motivation to select more emotionally-satisfying social interactions.

Despite the theoretical importance of linking future time perspective and motivation in explaining age differences in emotion regulation and well-being, there is little direct empirical research on the relationship. Given the empirical evidence linking future time perspective to a more maladaptive emotional profile (Grühn et al., 2016; Kessler & Staudinger, 2009), the empirical link between future time perspective, motivation to regulate one's emotions, and effectiveness at regulating one's emotions might show a more complex interplay. Therefore, the overarching goal of the current study is to examine the link between motivation, future time perspective, and emotion regulation skills.

Motivation and the Pursuit of Well-Being

Motivation may also be influenced by other aspects of time. For instance, with the passage of time, older adults may accumulate knowledge and expertise at regulating their emotions (see Strength and Vulnerability Integration; SAVI; Charles, 2010). Older adults report greater control over their emotions (Gross et al., 1997; Lawton et al., 1992) and demonstrate increased efficiency in emotion regulatory processes compared to younger adults (i.e., John & Gross, 2004). For instance, while down regulating their emotions, older adults demonstrated maintained memory performance (Emery & Hess, 2010) and working memory capacity (Scheibe & Blanchard-Fields, 2009) whereas younger adults demonstrated

decrements in both declarative memory and working memory when regulating their emotions. This may be, in part, due to an accumulation of experience at regulating one's emotions in later life, which may reduce the difficulty of engaging in emotion regulatory processes. Continued practice of dealing with emotionally stressful experiences is suggested to increase older adults' capability of handling stressors. Frequent use of an emotion regulation strategy has been associated with more automatic initiation of that strategy and thus, making it more efficient over time (Gyurak, Gross & Etkin, 2011). For example, older adults self-report less emotional arousal when asked to regulate one's emotions compared to younger adults (Magai et al., 2006), demonstrate more automatic orienting toward positive stimuli (Isaacowitz, Wadlinger, Goren, & Wilson, 2006) and away from negative stimuli in a dot-probe task (Carstensen & Mather, 2003). Older adults may be more effective at using emotion regulation strategies because of the increased efficiency of emotion regulation strategies to maintain their affective well-being. Overall, regulating one's emotions may be less difficult in older adulthood due to the accumulation of experience and automaticity of emotion regulation processes.

Motivation may, in turn, be influenced by more automatic emotion regulation (i.e., less difficulty) due to age-related changes in goal pursuit. Older adulthood is a time when the ratio of gains and losses shifts more towards losses (Baltes, 1990). During this time, older adults may adjust their goals to more attainable ones in domains that may not have demonstrated losses (i.e., expertise in emotion regulation; Brandstädter, Wentura & Greve, 1993). Thus, it may be the case that emotion regulation is perceived as less demanding which in turn may impact motivation towards this emotion-oriented goal. Based on this evidence,

age may be related to changes in perceived subjective difficulty for regulatory processes. That is, older adults may perceive regulating their emotions as less difficult due to their accrued knowledge and expertise (Charles, 2010), which in turn, may increase their motivation and emotion regulation outcomes.

Evidence of Age Differences in Emotion Regulation Strategy Selection

Age differences in emotion regulation effectiveness may also be a function of changes in strategy selection in later life. Young and older adults may prefer different strategies impact their socioemotional well-being and the associated cognitive costs of engaging in regulation (John & Gross, 2004). Emotion regulation can be classified as engaging (approach-focused) and disengaging (avoidance-focused) strategies (John & Gross, 2004). Engaging strategies focus on the emotional-arousing stimulus or context. A person may, for example, actively engage with a stressor to reduce its impact by cognitively reinterpreting the meaning of the emotional event (reappraisal). Disengaging strategies focus on escaping the emotional stimulus or context. For instance, a person may distract himself or herself from the emotional event by redirecting attention (distraction). Although age differences in the selection of emotion regulation strategies have been suggested to impact effectiveness of regulating one's emotions, there are mixed findings regarding the type of strategies that older adults preferentially select.

Older adults are theorized to be motivated to use more disengaging emotion regulation strategies. For example, older adults tend to look away from negative stimuli and towards positive stimuli whereas young adults have been found to show the inverse looking preferences (Isaacowitz, 2006). Similarly, Scheibe, Sheppes, and Staudinger (2015) found

that older adults tend to selectively prefer distraction over reappraisal when looking at negatively arousing images than younger adults and that distraction was found to predict higher affective well-being for older adults, but not for younger adults. Shifts towards disengaging emotion regulation strategies in later life have been posited to be a function of increased focus on the present and emotion-focused goals (i.e., Isaacowitz et al., 2006; Carstensen et al., 1999). Older adults, when given the choice of how to regulate their emotions, may be more motivated to use disengaging strategies that provide short-term relief and maintain their present affective well-being. Disengaging emotion regulation strategies such as avoiding confrontation may be the strategy of choice for regulating emotions and maintaining harmony in the context of interpersonal problems. Indeed, older adults endorse more disengaging strategies within interpersonal conflicts compared to younger adults (Birditt & Fingerman, 2005; Blanchard-Fields & Coats, 2008). Disengaging emotion regulation strategies may have fewer costs due to the earlier disengagement from the negative stimulus and greater perceived benefits for maintaining current affective state. In contrast, engaging strategies, which require more cognitive resources, can be beneficial in terms of long-term adaptation. Due to age-related declines in cognitive resources (i.e., Hasher & Zacks, 1988; Old & Naveh-Benjamin, 2008 Salthouse, 2006), older adults may be more inclined to use more disengaging emotion regulation strategies.

Alternatively, older adults have also been theorized to be motivated to use more engaging emotion regulation strategies. Older adults maintain their emotional well-being by selecting engaging emotion regulation strategies more often than young adults (Popham & Hess, 2014; John & Gross, 2004; Shiota & Levenson, 2009). For example, when examining

emotion regulation in young and older adults, Popham and Hess (2014) found that when older adults were given no instructions on how to regulate their emotions, older adults were more likely than young adults to report the use of positive reappraisal. John and Gross (2004) also found that older adults select to positively reappraise the emotional episode more often than other emotion regulation strategies. Engaging emotion regulation strategies such as reappraisal have been demonstrated to be less costly in regards to cognitive costs compared to response-focused emotion regulation strategies such as suppression (Richards & Gross, 2000) and more effective at regulating one's emotions (i.e., Urry & Gross, 2010). Therefore, despite engaging strategies requiring more cognitive resources, older adults may utilize these strategies more due to increased effectiveness of these strategies (i.e., Coats & Blanchard-Fields, 2008; Gross et al., 1997) and older adult's expertise that allows more efficient implementation of these strategies (i.e., Charles, 2010; Gyruak et al., 2011).

Taken together, several investigations have examined the use of engaging and disengaging emotion regulation strategies in older adulthood. However, there is little consensus on the preferences of these strategies and their impact on socioemotional functioning in older adulthood. One potential limitation to the previous investigations examining engaging and disengaging emotion regulation strategies in older adulthood is that studies commonly (a) examine age differences in one strategy (i.e., Popham & Hess, 2014; Noh, Lohani, & Isaacowitz, 2011), or (b) experimentally manipulate affect and ask young and older adults to select between two predefined strategies (i.e., Martins, Sheppes, Gross, & Mather, 2016; Scheibe, Sheppes, Staudinger, 2015; Sheppes et al., 2014; Sheppes, Scheibe, Suri & Gross, 2011). It may be the case that limiting older persons' strategies (i.e., focusing

on only two types of strategies) that they can endorse or utilize in the task impacts whether the older adult endorses more engaging or disengaging strategies. Therefore, an exploratory goal of the current study is to examine age differences in emotion regulation strategy choice. Improving on previous designs, the current design will allow older adults to freely select between multiple engaging and disengaging strategies after being presented with an affective stimulus. Additionally, to my knowledge, no investigation has examined the direct relationship between emotion regulation strategy choice, motivation and future time perspective. Thus, another goal of the current study is to examine how motivation and future time perspective influence emotion regulation strategy choice.

The Present Study

Age-related differences in future time perspective as suggested by socioemotional selectivity theory (Carstensen & Charles, 1998) have been used to explain age differences in the selection and effectiveness of emotion regulation strategies. There is, however, limited empirical work linking time perspective and motivation directly to emotion regulation. The exclusion of a measure of future time perspective is a deficit in examining the underlying mechanism that leads to better emotion regulation and well-being in older adults. Therefore, the current study has three main goals: First, to directly examine whether age differences in intrinsic motivation to regulate one's emotions are influenced by future time perspective. This will fill the gap in emotion research by directly testing the link between future time perspective and motivation in later life. Based on previous work linking a more limited future time perspective to poorer emotional well-being, I hypothesized that a more limited future

time perspective will be linked to less intrinsic motivation to regulate one's emotions whereas a more expansive future time perspective would be linked to higher intrinsic motivation to regulate one's emotions.

Secondly, the present study aimed to examine the role of intrinsic motivation and future time perspective between age and emotion regulation outcomes. Previous research has proposed that age differences in the effectiveness of emotion regulation in later life are due to age differences in future time perspective and motivation to regulate one's emotions. The present study is the first investigation to directly test this mediation. I hypothesized that motivation, and not future time perspective, would mediate the relationship between age and emotion regulation outcomes.

Finally, the present study aimed to examine how motivation and time perspective influence emotion regulation strategy choice. Previous investigations have shown mixed findings regarding whether older adults utilize more engaging or disengaging emotion regulation strategies to maintain their affective well-being. The present study aimed to examine whether younger and older adults differentially select emotion regulation strategies and the importance of time perspective and motivation for strategy selection. In order to fill the gap, the present study aimed to examine a large range of emotion regulation strategies and allow participants to freely select the strategy which they used to regulate their emotions. This may help to clarify which strategies young and older adults typically use in real life.

In order to do so, an emotion regulation task was implemented to examine (a) which strategies young and older adults select, and (b) the effectiveness of young and older adults' emotion regulatory processes. Participants engaged in an emotion regulation task where they

viewed a series of negatively valenced images and reported which strategies they used to control their emotions, how they are currently feeling (i.e., actual effectiveness) and how competent they felt at regulating their emotions (i.e., perceived effectiveness). Subsequently participants rated their intrinsic motivation to engage in the emotion regulation task, perceptions of time, and the perceived costs of regulating their emotions.

Methods

Participants

Participants were recruited through Amazon's Mechanical Turk (MTurk). MTurk is a crowdsourcing website whose validity for survey research has been demonstrated (see Behrend, Sharek, Meade, & Wiebe, 2011; Buhrmester, Kwang, & Gosling, 2011). Participants on MTurk (i.e., Turkers) were restricted to those residing within the United States and those who had previously a 95% approval rating from other completed Human Intelligence Tasks (HITs).

Based on the observed effect sizes ($.10 < \eta^2 < .15$) in previous research on age differences in emotion regulation (Scheibe et al., 2015; Nohlen-Hoeksema & Aldao, 2011), power analyses for an effect size of .10 and power of .90 using G*Power suggested a sample size of 134 participants. In order to account for potential attrition (e.g., inconsistent responding), 210 participants were recruited initially. To ensure the validity of responses, chronological age and date of birth were collected on two separate pages of the survey. Age was then calculated from their specified birth date and compared to reported chronological age. Participants were excluded either due to a mismatch between chronological age and birth date ($n = 28$), self-reported engagement in other activities during the survey ($n = 2$) or

inconsistent and/or unusual responding (n = 2) such as reported neutral images (a bowl and a fan) at extremes of arousal and valence or reported inability to regulate emotions in open-ended follow-up questions after completing the emotion regulation task. Thus, the final sample was 178 ranging from 20 to 88 years old (M_{age} = 44.63, SD_{age} = 15.88; 55.70% female). Participants were predominantly white (81.90%).

Measures

Future Time Perspective. Future time perspective was assessed with the 10-item Future Time Perspective Questionnaire (Carstensen & Lang, 1996) on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). Sample items are "*Many opportunities await me in the future*" or "*I have the sense that time is running out*" (reverse coded). Internal consistency for this scale has been demonstrated in previous research to be high, α = .90 (Grühn et al., 2016; Kessler & Staudinger, 2009). Similarly, internal consistency in the current study was high, α = .93.

Intrinsic Motivation. Intrinsic motivation for the emotion regulation task was assessed using the 30-item Intrinsic Motivation Inventory (IMI; Ryan, 1982). The IMI consists of 5 dimensions to capture intrinsic motivation and self-regulation: interest/enjoyment (7 items), perceived competence (6 items), effort (5 items), felt pressure/tension (5 items), and perceived choice (7 items) while performing the given task. Internal consistencies for each of the components of the IMI in past research have shown to be adequate ranging from .68 < α < .84 (McAuley, Duncan, & Tammen, 1989). In the present study, internal consistency across the dimensions and composite scores were high .80 < α < .90. In particular, effort (α =.80) subscale were used as an index of motivation in the

emotion regulation task and the competence subscale (α = .87) was used an index for perceived effectiveness.

Subjective Difficulty. Subjective difficulty was measured in two ways. First, the perceived costs of a task was measured for each stimulus by asking participants to rate the level of difficulty they experienced while regulating their emotions on a 7-point scale ranging from *Not at all* (1) to *Extremely* (7). Internal consistency for subjective difficulty ratings across the twenty images was high (α = .95). Second, the overall perceived costs of engaging in the emotion regulation task were assessed using the National Aeronautics and Space Administration Task Load Index (NASA TLX; Hart & Staveland, 1988). The NASA-TLX assesses perceptions of task demands based on six subscales: mental demand, physical demand, temporal demand, performance, effort, and frustration. Participants rated their perceptions of task demands from *very low* (1) to *very high* (7). Mental and physical demand asked participants to rate how physically or mentally demanding the task was. Temporal demand assessed how hurried or rushed the pace of the task was. Performance assessed perceptions of successfulness on the task at hand. Effort assessed how hard you had to work to accomplish your level of performance. Frustration assessed how insecure, discouraged, irritated, stressed and annoyed the participant was during the task.

Trait Affect. Trait affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a short 20-item self-report measure that consists of words that describe different feelings and emotions that the individual feels in general. Items were assessed on a 7-point scale from *very rarely* (1) to *very frequently* (7). The PANAS has shown good internal consistencies for positive affect

(PA) ranging from .86 to .90, and negative affect (NA) ranging from .84 to .87 (Watson, Clark, & Tellegen, 1998). In the current study, positive affect (α = .91) and negative affect (α = .94) internal consistencies were high.

Emotion Regulation Goals. Emotion regulation goals were measured using the Self-Regulation of Withholding Negative Emotions Questionnaire (SRWNE; Kim, Deci, & Zuckerman, 2002). The SRWNE is a 28-item questionnaire that measures people's motivation to withhold expression of negative affect. The scale consists of two overarching subscales: controlled and autonomous regulation. Controlled regulation is externally driven or pressured by interindividual factors or internalized social norms whereas autonomous regulation is internally driven by choice (Kim et al., 2002) The SRWNE has shown good internal consistencies for controlled ($.85 \leq \alpha \leq .90$) and autonomous ($.78 \leq \alpha \leq .85$) regulation. In the present study, internal consistency was high (autonomous α = .91, controlled α = .91).

Emotion Regulation Effectiveness. To measure emotion regulation effectiveness, subjective emotional reactivity elicited by each image in the emotion regulation task, participants were asked to rate their overall valence and arousal. Valence was assessed using a single item on a 7-point scale ranging from *very positive* (1) to *very negative* (7). Arousal was assessed using a single item on a 7-point scale ranging from *very relaxed* (1) to *very tense* (7). Therefore, higher scores indicate worse actual effectiveness at the emotion regulation task. In addition to actual effectiveness at down regulating one's negative emotions, the competence subscale of the IMI and the performance subscale of the NASA-TLX were used to assess perceived effectiveness.

Emotion Regulation Strategy Selection. To measure emotion regulation strategy selection elicited by each image in the emotion regulation task, a single item was used: "To regulate my emotions while viewing the image, I…" Participants were asked to select at least one out of the listed strategies: 1) "tried to view the positive side of the situation" (positive reappraisal), 2) "tried to view the image in an unemotional way (detached reappraisal), 3) "looked away from the negative parts of the image or close my eyes" (avoidance), 4) "tried to think about something else besides the image" (distraction), and 5) "could not regulate my emotions." An additional "Other" category was listed and allow participants to write in strategies that they may have used but felt were not represented in the choices listed above. Positive reappraisal and detached reappraisal represent engaging strategies (i.e., approach-focused) whereas distraction and avoidance represent disengaging strategies (i.e., avoidance-focused). No regulation responses represent when participants reported they could not regulate their emotions or wrote in that they did not need to regulate their emotions. Write-in responses (n = 76) were coded into one of the previously defined categories (i.e., positive reappraisal, detached reappraisal, avoidance, distraction, no regulation) by two graduate students (interrater reliability = .79). Disagreements were resolved through discussion between the coders.

Stimuli. Twenty-seven images from the Affective Image Database (AID; Grühn, Kapkin, & Sharifian, 2015) were selected based on their valence and arousal norms. Two images were selected to be neutral and low arousing for practice trials to familiarize the participants with the procedure of the emotion regulation task. Twenty images were selected to be highly negative and highly arousing. Five positively-valenced images were selected to

be presented to participants during the debriefing stage in order to alleviate any lingering negative feelings. Descriptive information regarding the content, valence, and arousal norms for the image selections are listed in Table 1.

Procedure

At the start of the survey, participants initially completed a consent form, followed by completing the background questionnaire, FTP, SRWNE, and PANAS questionnaires. Participants then moved onto the main part of the experiment: the emotion regulation task.

Emotion Regulation Task. The emotion regulation task was an adapted version from previous investigations examining emotion regulation strategy choice and emotion reactivity to emotionally-arousing stimuli (i.e., Martins et al., 2016; Scheibe et al., 2015; Sheppes et al., 2011). That is, previous investigations had participants identify which strategy they planned on using to regulate their emotions beforehand. In the current study, participants were asked afterwards what strategy they used. Before beginning the task, participants were given explanations and examples of commonly-used emotion regulation strategies:

"While viewing each image, try to regulate your emotions in a way that you best see fit. There are several ways in which people commonly regulate their emotions such as distracting themselves, avoiding the negative information, reframing the image in a more positive manner or in an unemotional way. There is no right or wrong ways to regulate your emotions while viewing the images. Feel free to use whatever strategy is most effective for you. Your task is to simply use the strategy that makes you feel <u>the least negative</u> while viewing the images."

Participants then completed two practice trials with neutral, low arousing images in order to familiarize themselves with the procedure. During the main emotion regulation trials, participants viewed emotionally-arousing images and were instructed to regulate their emotions. Images from the task were randomized for each participant to reduce potential ordering effects. To direct attention to the stimulus, a fixation cross was presented in the center of the screen for 2,000 ms before the presentation of each stimulus. Afterwards, an image was presented for 10,000 ms immediately followed by five items to assess 1) emotion regulation strategy choice, 2) valence, 3) arousal, 4) subjective difficulty of regulation, and 5) their perceived discrete emotion of the image. No time limit was given for participants to answer these items. Once completed, participants continued to the next image, which was presented with the same structure.

After completing the emotion regulation task, participants completed the Intrinsic Motivation Inventory and the NASA-TLX to assess the individual's intrinsic motivation and perceived costs of regulating one's emotions in the task. Participants were then debriefed about the purpose the current study and were asked to provide any feedback or comments they had about the emotion regulation task.

Results

Before beginning to analyze the data, all scales were screened for missing data and potential outliers. Data were processed and analyzed using SPSS and Amos (Version.24 IBM Corp, USA). Scores were calculated for emotion regulation choice from the task, intrinsic motivation, and future time perspective. For emotion regulation strategy selection, the percentage of engaging strategies, disengaging strategies, and no strategies selected were

calculated. Therefore, emotion regulation strategy selection is continuous ranging from 0 to 100. Descriptive statistics across motivation, time perspective, strategy selection, valence and arousal are listed in Table 1.

Preliminary correlations were conducted to investigate the age differences in motivation, future time perspective and subjective difficulty and are listed in Table 2. Consistent with previous research, older age was significantly associated with a more limited future time perspective. Age was also found to be positively associated with motivation (effort, autonomous regulation). That is, older participants reported greater effort in the emotion regulation task and reported more internally-motivated emotion regulation goals. Age was negatively associated with disengaging emotion regulation strategies. Older participants reported using disengaging strategies less than younger participants.

Future time perspective was significantly associated with controlled regulation. Individuals with limited future time perspectives reported higher controlled regulation (i.e., externally-motivated regulation). However, future time perspective was not significantly associated with motivation (effort, autonomous regulation), emotion regulation strategy selection (engaging, disengaging) or actual (arousal, valence) and perceived effectiveness (competence subscale of IMI). Motivation, however, was found to significantly relate to emotion regulation. Effort was positively associated with age, competence, valence, and arousal and negatively associated with disengaging strategy selection. That is, individuals who reported greater effort also reported higher competence, arousal, more negative emotions, and less use of disengaging emotion regulation strategies.

Subjective difficulty was not associated with age, time perspective, or effort. Subjective difficulty, however, was associated with engaging and disengaging strategy selection, valence, and arousal. Individuals who reported higher subjective difficulty reported lower use of engaging and higher use of disengaging strategies, more negative valence, and higher arousal during the emotion regulation task.

Future Time Perspective, Motivation and Subjective Difficulty as Mediators

To address the main research question of whether future time perspective, motivation (effort), or subjective difficulty mediated the relationship between age and emotion regulation, several separate structural equation models (SEM) were conducted. The basic structure among the predictor and mediators were similar across models. Age was represented by a single item measure and was directly used as manifest variable in the model. Future time perspective, motivation, and subjective difficulty were represented by latent variables. For all latent variables, parcels as recommended by Little, Cunningham, Shahar, and Widaman (2002) were created. Parcels are often used in SEMs to create indicator factors that show enhanced distribution qualities, as a composite of several items is more likely to be normally distributed than each individual item. Items across each construct were combined into parcels by alternating based on their original order in the survey. Age, future time perspective, motivation, and subjective difficulty were then used to predict different emotion regulation outcomes. Model fit was determined in all subsequent structural equation models based the relative fix indexes: a Tuckers-Lewis Index (TLI), Comparative Fix Index (CFI) approximately .95 (Hu & Bentler, 1998; 1999) and a root mean squared error of approximation (RMSEA) of .08 or lower. In addition, in order to test whether future time

perspective, motivation, and subjective difficulty mediated the relationship between age and the emotion regulation outcomes, a bootstrap estimation approach with a sample of 1,000 was used to test the indirect effect across all subsequent models (Hayes, 2009; Shrout & Bolger, 2002).

Emotion Regulation Effectiveness. Initially, perceived effectiveness at the emotion regulation task was assessed in relation to age, time perspective, motivation, and difficulty and is depicted in Figure 1. Due to the high association between competence and the performance subscale of the NASA-TLX (i.e., how successful were you at the task?), competence and performance were loaded onto the same latent variable. The model demonstrated adequate fit, $\chi^2(45) = 92.31$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .08 [.06, .10], $p = .026$.

Age significantly predicted a more limited FTP and greater effort, but did not predict subjective difficulty. In addition, age was not significantly associated with perceived effectiveness. However, effort and subjective difficulty were significantly associated with perceived effectiveness. Persons who reported higher effort also had greater perceived effectiveness at the emotion regulation task and persons who reported greater subjective difficulty reported lower perceived effectiveness. The indirect effect of motivation between age and perceived effectiveness was tested and found to be significant ($\beta = .18$, CI = .09, .30, $p = .001$). That is, age was associated with greater effort in the emotion regulation task, and subsequently, greater perceived effectiveness at regulating one's emotions.

When examining the link between time perspective and motivation, a more limited future time perspective was associated with less effort in the emotion regulation task.

Therefore, individuals with more expansive perceptions of time put forth more effort in the task.

Actual effectiveness of regulating one's emotions was assessed using arousal and valence and is depicted in Figure 2. Valence and arousal ratings were averaged across images and were represented by manifest variables in the model. The model demonstrated adequate fit, $\chi^2(32) = 66.40$, $p < .001$, CFI = .98, TLI = .96, RMSEA = .08 [.05, .10], $p = .044$.

Due to variability in the content of the images, to ensure the validity of the previous model, the following models were conducted with alternative structures for actual effectiveness: (a) arousal and valence were calculated separately when participants used engaging and disengaging strategies, (b) arousal and valence were calculated within self-reported discrete emotions categories, (c) deviation scores of current ratings from the norms developed by the Affective Image Database, (d) deviation scores from the means for each images from the emotion regulation task, and (e) arousal and valence ratings for human and nonhuman images separately. Findings across all alternative models did not differ from the original aggregate valence and arousal structural equation model. Therefore, the original aggregate model is reported to be more parsimonious.

Consistent with the previous analyses, age was related to greater motivation and more limited future time perspective, however, age did not significantly predict arousal or valence. Motivation, however, was significantly associated with valence and marginally significantly related to arousal. That is, persons who reported more effort also reported higher arousal and more negative emotions. Subsequently, the indirect path of motivation between age and actual effectiveness was tested. This demonstrated a significant indirect effect of motivation

between age and valence (β = .09, SE = .04, CI = .04, .16, p = .003), and a marginally significant indirect effect between age and arousal (β = .05, SE = .03, CI = .01, .12, p = .053). Therefore, age was associated with more effort in the emotion regulation task, which subsequently led to higher arousal and more negative emotions.

Future time perspective was not associated with valence or arousal self-reports whereas subjective difficulty was. When individuals perceived the task as more difficult, they reported higher arousal and more negative affect. Analyses revealed no indirect effect for future time perspective or subjective difficulty.

Emotion Regulation Strategy Selection. Strategy selection was assessed by examining the use of engaging and disengaging emotion regulation strategies during the task and is depicted in Figure 3. Emotion regulation strategy selection was represented by two manifest variables: percentage of engaging and disengaging strategies. The model demonstrated adequate fit, $\chi^2(32) = 68.05$, $p < .001$, CFI = .97, TLI - .95, RMSEA = .08 [.05, .11], p = .034.

Age was significantly related to using less disengaging strategies, but not engaging strategy selection. Similarly, motivation was significantly related to disengaging but not engaging strategy selection. Future time perspective did not significantly predict engaging or disengaging strategy usage. Subjective difficulty was significantly related to less engaging and more disengaging strategy selection.

Motivation revealed a significant indirect effect for disengaging strategy selection (β = -.08, SE = .04, CI = -.17, -.02, p = .029). That is, age was associated with more effort to engage in the emotion regulation task which subsequently was related to lower use of

disengaging strategies. Motivation, however, did not significantly mediate the relationship between age and engaging strategy selection.

Emotion Regulation Goals. An additional model was conducted to examine the relationship between motivation, future time perspective and well-being. This was conducted as a robustness technique to replicate and extend the previous findings (see Duncan, Engel, Claessen & Dowsett, 2014 for robustness techniques). That is, the previous findings may be a function of the emotion regulation task. Therefore, in order to examine the robustness of the findings, an alternative structural equation model was conducted to examine the relationship between age, time perspective, emotion regulation goals, and well-being and is depicted in Figure 4. Emotion regulation goals were captured using the SRWNE which measured autonomous (i.e., internally-motivated) and controlled (i.e., externally-motivated) motivation for regulating one's emotions. The PANAS was used to examine well-being which measured positive and negative affect experience in general. Latent variables were constructed for autonomous regulation, controlled regulation, future time perspective, positive affect and negative affect. The model demonstrated adequate fit, $\chi^2(40) = 77.96$, $p < .001$, CFI = .97, TLI = .95, RMSEA = .07 [.05, .10], $p = .059$.

Age was associated with a more limited future time perspective and greater positive affect. Additionally, age was also positively associated with autonomous regulation, but not controlled regulation. That is, older persons reported more internally-motivated regulation. Consistent with previous findings (Grühn et al., 2016), a more limited time perspective was associated with lower positive affect and higher negative affect. In addition, a more limited future time perspective was also associated with less autonomous regulation. Persons who

reported more autonomous regulation also reported less negative affect whereas persons who reported more controlled regulation reported higher negative affect and less positive affect. To further examine the role that autonomous regulation plays between age and negative affect, the indirect effect was tested and found to be significant, (β = -.13, SE = .05, CI = -.28, -.05, p = .007). That is, older age was significantly associated with more autonomous regulation and in turn, lowers negative affect.

To further examine the underlying motivation of regulating one's emotions, a structural equation model was conducted in which age, future time perspective, autonomous regulation, and controlled regulation were predictors of effort to engage in the emotion regulation task. The model is depicted in Figure 5 and demonstrated adequate fit, $\chi^2(26)$ = 54.10, p = .001, CFI = .97, TLI = .95, RMSEA = .08 [.05, .11], p = .056.

Consistent with the previous models, age was positively associated to autonomous regulation and motivation and negatively associated with future time perspective. Of interest, autonomous regulation was positively associated with motivation and controlled regulation was negatively associated with motivation. That is, individuals who reported more autonomous regulation reported engaging in more effort in the emotion regulation task whereas individuals who reported more controlled regulation reported engaging less effort in the task. A significant indirect effect of autonomous regulation as found, (β = .19, SE = .06, CI = .08, .28, p = .002). Older adults were more internally-motivated to regulate their emotions and in turn, were associated with greater effort to engage in the emotion regulation task.

Follow-Up Analyses. The main analyses suggested that a limited future time perspective did not mediate the relationship between age and emotion regulation outcomes. Additionally, the analyses suggested that a limited future time perspective was associated with less motivation, the inverse of the findings for chronological age. Similar to previous research (Grühn et al., 2016), follow-up regression analyses were conducted to examine the potential moderating effects between age and future time perspective to clarify potential empirical associations. Specifically, for each emotion regulation outcome and motivation, a two-step regression analysis was conducted. In Step 1, age and future time perspective were included as predictors. In Step 2, the interaction between age and future time perspective as well as the quadratic effects for age and future time perspective were included. Age and future time perspective were standardized for these analyses.

For motivation (effort, autonomous regulation, controlled regulation), no significant Age x FTP interaction emerged. Similarly, for all emotion regulation outcomes (arousal, valence, perceived effectiveness, engaging strategies), no significant Age x FTP effect emerged with the exception of disengaging strategy selection (b = .22, p = .010). For younger adults, a more limited future time perspective was associated with greater use of disengaging strategies compared to younger adults with more expansive perceptions of time. For older adults, however, no significant difference in the use of disengaging strategies was found based on future time perspective, contrasting with the expectation that future time perspective influences emotion regulation strategy selection in later life.

Discussion

The main objective of the current study was to investigate the relationship between future time perspective, motivation, and emotion regulation processes. I specifically aimed to test the idea that a limited future time perspective is related to increased motivation to regulate one's emotions and thus, may function as an explanatory variable for observed age differences in emotion regulation. There were four major findings. First, although age was associated with a more limited future time perspective, future time perspective was not associated with any emotion regulation outcomes. Second, a limited future time perspective was found to be associated with less effort on the emotion regulation task and less internally-driven motivation to down regulate one's negative emotions in general, the inverse of chronological age. Third, motivation was found to be an important mediator between age and emotion regulation outcomes and that age differences in effort on the emotion regulation task were partially explained by older adults' internally driven emotion regulation goals. However, more effort on the emotion regulation task was not always associated with more effective emotion regulation. Rather, there was a discrepancy between perceived and actual effectiveness to regulate one's emotions. Older adults reported greater self-reported perceived effectiveness, but also reported greater feelings of negative emotions and higher arousal (i.e., actual effectiveness). Finally, older adults utilized less disengaging strategies during the emotion regulation task than younger adults and this was mediated by motivation.

Linking Future Time Perspective and Motivation to Emotion Regulation

Older adults in the current study reported a more limited future time perspective, consistent with previous cross-sectional (Coudin & Lima, 2011; Lang & Carstensen, 2002) and longitudinal studies (Kotter-Grühn & Smith, 2011). Of interest, when examining the link

between future time perspective and motivation, a more expansive future time perspective was associated with more motivation in the emotion regulation task. This was further supported in the alternative model in which a more expansive time perspective was associated with higher reports of autonomous regulation. That is, when individuals perceive their time as more expansive in the future, they put forth more effort to regulate their emotions and they use more internally-motivated to down regulate their negative emotions. Previous work has found autonomous regulation (i.e., internally-motivated) to be associated with greater well-being and physical health outcomes (Kim, Deci, & Zuckerman, 2002), suggesting that the use of autonomous regulation is more adaptive. This contrasts with the previous assumption that a more limited future time perspective is associated with greater motivation towards emotion regulation goals (Carstensen et al., 1999).

Contrasting with future time perspective, age demonstrated the inverse relationship with motivation in which older adults put forth more effort and reported greater internally-driven motivation. Thus, despite older adults have more limited perceptions of time, older adults reported more motivation to regulate their emotions. This motivation led to lower reports of negative affect and greater effort on the emotion regulation task. This finding is consistent with previous research that found that older adults valued emotion regulation goals to a greater extent than younger adults, which subsequently influenced emotion regulation and well-being (Coats & Blanchard-Fields, 2008).

Further, these age differences in motivation led to greater perceived effectiveness for the emotion regulation task, suggestive that older adults perceive themselves as more capable and successful at engaging in emotion regulation processes. This may be indicative of greater

social and emotional expertise in later life (Charles, 2010) that plays a role in the goals in which older adults pursue. That is, older adults may shift their goals towards more attainable goals within domains that have not experienced age-related deficits (Brandstädter, Wentura & Greven, 1993). Previous research has found that older adults demonstrate increased expertise in socioemotional functioning and subsequently, increased effectiveness at regulating their emotions. For instance, when making moral judgments, older adults and younger adults with high social expertise demonstrated increased sensitivity to cues when making judgments compared to younger adults with low social expertise (Hess, Osowski, & Leclerc, 2005). This is consistent with the notion that with increased experience comes expertise. Older adults have also reported better emotional outcomes in daily life such as a greater reports of positive daily events (Whitehead & Bergeman, 2013), fewer negative social interactions (Birditt & Fingerman, 2005), and reduced impact of minimizing negative emotions (Birditt, 2014) and negative daily experiences (Whitehead & Bergeman, 2013) compared to younger adults. These findings have been suggested to be due to greater expertise in navigating daily life and better emotion regulation at dealing with negative daily events.

Overall, the findings suggest that older adults demonstrate greater motivation to regulate their emotions and that this motivational shift was not related to their perceptions of time. Based on this finding, it may be the case that older adults have shifted their goals to a domain that has been well-maintained rather than an intentional shift towards emotion-focused goals due to perceiving their time as more limited. Although older adults were more motivated to regulate their emotions and perceived themselves as more competent at doing

so, our findings did not demonstrate age differences in subjective difficulty. This finding was opposite of expectations that older adults may report less difficulty to regulate their emotions due to increased automaticity of emotion regulatory processes (Gyurak et al., 2011).

Motivation, however, does not always equate performance. Rather, a discrepancy was found between actual and perceived effectiveness in the emotion regulation task. That is, greater effort on the emotion regulation task was associated with greater perceived effectiveness, but poorer actual effectiveness (i.e., higher arousal and negative affect). This finding is consistent with previous evidence that found that older adults' self-report greater control over their emotions (i.e., Gross et al., 1997; Lawton et al., 1992) and perceived effectiveness of down regulating negative emotions after a failure (Kessler & Staudinger, 2009). There are, however, some mixed findings suggesting that older adults may be more emotionally reactive in some cases than younger adults (i.e., Kunzmann & Grühn, 2005; Schilling & Diehl, 2015). For instance, some evidence has found that older adults report greater emotional reactivity to emotionally empathetic content and prosocial behavior (Sze, Gyurak, Goodkind & Levenson, 2012) and positive and negative images (Reekum et al., 2001). In particular, Kunzmann and Grühn (2005) found that when emotional content was age-salient (i.e., sadness inducing), older adults self-reported greater emotional reactivity compared to younger adults.

This discrepancy between perceived and actual effectiveness may reflect the nature of the task that participants were asked to engage in. In particular, the immediacy of the presentation of negative stimuli and temporal duration to regulate one's emotions may have influenced actual effectiveness to down regulate negative emotions. In the current task,

participants were exposed to a series of negative stimuli that may have increased reactivity due to the prolonged exposure to high-intensity negative information.

Although older adults are suggested to have age-related increases in socioemotional functioning, they may also have age-related vulnerabilities. For instance, when presented with negative information for a sustained period of time that elicits high emotional arousal, older adults have been suggested to demonstrate a breakdown in these age-related increases in regulatory processes (Charles, 2010). In the current task, a series of highly negative images were presented for a prolonged period of time. Thus, whereas older adults may have felt more motivated and competent in their emotion regulation skills, the intensity and immediacy of the negative information may have made older adults more vulnerable (Charles, 2010).

There is some evidence to further suggest that the temporal duration of the negative information may also play an important role in effectiveness of down regulating negative emotions. Previous research suggests that older adults may be more vulnerable to momentary negative affect during the acute confrontation of that negative information, but may demonstrate increases in self regulation that influence emotional responses as time passes (Schilling & Diehl, 2015). For instance, some evidence has found no age differences in stress reactivity initially to stressful events but better recovery from stressful events for older adults compared to younger adults (Schilling & Diehl, 2014). Previous research has additionally found no age differences in emotion regulation or poorer emotion regulation outcomes in older adults when directly presented negative stimuli within a laboratory context (Phillip et al., 2008). This is consistent with the findings of the current study that although older adults

demonstrated more reactivity when exerting more effort on the emotion regulation task, they reported less negative affect in general which was related to older adults' more internally driven emotion regulation goals. Therefore, the importance of the context and temporal dimension of regulation may be critical for effective emotion regulation in later life.

Age Differences in Emotion Regulation Strategy Selection

Previous research has demonstrated mixed findings regarding whether older adults engaged in more engaging or disengaging emotion regulation strategies to optimize their well-being. Some evidence suggested that older adults use more disengaging (Isaacowitz, 2006; Scheibe et al., 2015) while others found that older adults were more likely to use engaging emotion regulation strategies (e.g., Popham & Hess, 2014; John & Gross, 2004). In the current study, older age was associated with less use of disengaging emotion regulation strategies such as distraction and avoidance and this was mediated by motivation. That is, older adults reported engaging in more effort on the task and motivation was associated with less use of disengaging strategies.

This contrasts with the idea that older adults may be more motivated to disengage earlier from the negative stimuli in order to maintain their emotional well-being (Reed & Carstensen, 2012). This finding, however, is consistent with previous evidence that older adults utilize more engaging strategies and that these strategies tend to be more effective at managing their emotions. For example, Luong and Charles (2014) found that older adults were less likely to engage in conflict avoidance and de-escalation behaviors during a negative social exchange than younger adults and that this strategy use was mediated by goals regarding task performance and event appraisal. Similarly, Coats and Blanchard-Fields

(2008) examined age differences in emotion regulation strategy selection and emotion regulation goals and found that older adults valued emotion regulation goals which led to the use of more proactive emotion regulation, less passive emotion regulation and more direct problem solving techniques. Similarly, Lohani and Isaacowitz (2013), when examining emotion regulation, found that positive reappraisal was associated with a greater decrease in negative mood than attentional deployment. Additionally, attentional deployment was more physiologically costly during the emotion regulation task. This is consistent with the current finding that greater motivation may not led to less engagement with the emotional content, but rather, less use of disengagement. Engaging strategies, such as reappraisal, may direct attention away from the negative information while putting a positive spin on the content whereas disengaging strategies, such as attentional deployment, may simply be used to refocus attention away from the negative and may be perceived as a less effective strategy to down regulate negative emotions.

Limitations and Outlook

Although the current study sheds light on the underlying mechanisms behind age differences in emotion regulation outcomes, there are some notable limitations. First, in the current study, participants engaged in an emotion regulation task in which they were presented a series of negative images. Thus, the negative information presented is somewhat decontextualized. Images may not convey the complete context of the negative scene. For example, a participant being presented an image of a middle-aged man weeping next to a grave may interpret the image differently. As previously mentioned, older adults may fare better at regulating their emotions in more ecologically valid settings. Again, the context and

temporal aspect of regulation may play a role in how effective older adults are at regulating their emotions. It may be the case that older adults fare better at dealing with emotional information in their day-to-day lives compared to this controlled presentation of negative images. The current study addressed this issue by examining the relationship between emotion regulation, motivation, and time perspective in an emotion regulation task and with more general measures of well-being and emotion regulation goals, however, future studies need to further investigate how contextual factors may influence age differences in emotion regulation outcomes.

Similarly, the context of the emotion regulation task may also influence strategy selection. That is, some evidence suggests that older adults are more likely to use avoidance or situation selection to effectively manage their emotions in their lives (Birditt & Fingerman, 2005). Thus, strategy selection in the current task may differ from day-to-day strategy selection. Additionally, emotional episodes are complex and occur over time. For example, arguments can last hours if not days. Health problems can be chronic stressors that an individual must deal with. Little work has examined strategy use of the course of an emotional event. It may be the case that younger and older adults engage in multiple strategies over time to deal with a negative event. Future research should further examine how young and older adults regulate their emotions over the course of an emotional event.

The current study as well as past research has predominantly focused on age differences in emotion regulation outcomes (i.e., Scheibe et al., 2015; Shiota & Levenson, 2009). Little work has examined how emotion regulation processes change directly across time. Therefore, the current findings may be a function of cohort effects. Future research

should utilize longitudinal and micro-longitudinal designs to examine age-related change in emotion regulation outcomes such as effectiveness and strategy selection. Similarly, the current study recruited participants through Amazon's Mechanical Turk. Although MTurk has been demonstrated to be a valid and reliable recruitment method in psychological research (i.e., Berinsky, Huber & Lens, 2012), participants on MTurk may still be subject to sample selection issues. That is, participants on MTurk differ in demographic and personality characteristics compared to in-person sampling recruitment methods (Paolacci & Chandler, 2014). Future research should replicate the current findings with alternative sampling methods.

Finally, the current study focused on the down regulation of negative emotions, however, individuals may choose to up regulate positive emotions when dealing with negative stimuli or engage in acceptance of the negative experience to reduce regulate their emotions. Therefore, it could be the case that age differences in acceptance and up regulation of emotions may differ from the current findings. Future research should investigate the use of up regulation of positive emotions and emotional acceptance.

Conclusion

In conclusion, the relationship between future time perspective, intrinsic motivation and emotion regulation outcomes was investigated and revealed that motivation, but not future time perspective, mediated the relationship between age and emotion regulation outcomes. A more expansive future time perspective was found to be related to greater motivation on the task and more internally-motivated emotion regulation goals in general, opposite of assumptions of socioemotional selectivity theory. These findings emphasize the

notion that although future time perspective may be associated with social motives, it may not be the underlying mechanism behind age differences in emotional processes.

REFERENCES

Behrend, T. S., Sharek, D. J., Meade, A. W., & Wiebe, E. N. (2011). The viability of crowdsourcing for survey data. *Behavior Research Methods*, *43*, 800–813. https://doi.org/10.3758/s13428-011-0081-0

Berinsky, A.J., Huber, G.A., & Lenz, G.S. (2012). Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis, 20,* 351-368. https://doi.org/10.1093/pan/mpr057

Birditt, K.S. (2014). Age differences in emotional reactions to daily negative social encounters. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 69,* 557-566. https://doi.org/10.1093/geronb/gbt045

Birditt, K.S., & Fingerman, K.L. (2005). Do we get better at picking our battles? Age group differences in descriptions of behavioral reactions to interpersonal tensions. *Journal of Gerontology: Psychological Sciences, 60B,* 121-128. https://doi.org/10.1093/geronb/60.3.P121

Blanchard-Fields, F., & Coats, A.H. (2008). The experience of anger and sadness in everyday problems impacts age differences in emotion regulation. *Developmental Psychology, 44,* 1547-1556, https://doi.org/ 10.1037/a0013915

Buhrmester, M. D., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical turk: A new source of inexpensive, yet high quality data. *Perspectives of Psychological Science*, *6*, 3–5.

Brandstädter, J., Wentura, D., & Greve, W. (1993). Adaptive resources of the aging self: Outlines of an emergent perspective. *International Journal of Behavioral Development, 1*6, 323-349. https://doi.org/ 10.1177/016502549301600212

Brothers, A., Gabrian, M., Wahl, H., & Diehl, M. (2016). Future time perspective and awareness of age-related change: Examining their role in predicting psychological well-being. *Psychology and Aging, 31,* 605-617. http://dx.doi.org/10.1037/pag0000101

Carstensen, L.L., & Charles, S.T. (1998). Emotion in the second half of life. *Current Directions in Psychological Science, 7,* 144-149. https://doi.org/10.1111/1467-8721.ep10836825

Carstensen, L.L. ., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist, 54,* 165–181. https://doi.org/10.1037/0003-066X.54.3.165

Carstensen, L.L., Fung, H.H., & Charles, S.T. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion, 27,* 103-123. https://doi.org/ 10.1023/A:1024569803230

Carstensen, L. L., & Lang, F. R. (1996). Future Orientation Scale, Unpublished Manuscript, Stanford University.

Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of Personality and Social Psychology, 79,* 644–655. https://doi.org/10.1037/0022-3514.79.4.644

Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin, 136,* 1068–1091. https://doi.org/10.1037/a0021232

Charles, S.T., & Carstensen, L.L. (2010). Emotion regulation and aging. In Handbook of Emotion Regulation (Gross, James J. (Ed); 669-685). New York, NY, US: Guilford Press.

Charles, S. T., Piazza, J. R., Luong, G., & Almeida, D. M. (2009). Now you see it, now you don't: Age differences in affective reactivity to social tensions. *Psychology and Aging, 24*, 645–653. https://doi.org/10.1037/a0016673

Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology, 80,* 136–151. https://doi.org/1O.1O37//OO22-3514.80.1.I36

Coats, A.H. & Blanchard-Fields, F. (2008). Emotion regulation in interpersonal problems: The role of cognitive-emotional complexity, emotion regulation goals, and expressivity. *Psychology and Aging, 23,* 39-51. https://doi.org/10.1037/0882-7974.23.1.39

Coudin, G., & Lima, M. L. (2011). Being well as time goes by: Future time perspective and well-being. *International Journal of Psychology & Psychological Therapy, 11,* 219–232.

Duncan G.J., Engel, M., Claessens, A., & Dowsett, C.J. (2014). Replication and robustness in developmental research. *Developmental Psychology, 50,* 2417-2425. https://doi.org/10.1037/a0037996

Emery, L., & Hess, T. (2011). Cognitive consequences of expressive regulation in older adults. *Psychology and Aging, 26,* 388–396. https://doi.org/10.1037/a0020041

Fredrickson, B. L., & Carstensen, L. L. (1990). Choosing social partners: How old age and anticipated endings make people more selective. *Psychology and Aging, 5*, 335–347. https://doi.org/10.1037/0882-7974.5.3.335

Fung, H. H., & Carstensen, L. L. (2003). Sending memorable messages to the old: Age differences in preferences and memory for advertisements. *Journal of Personality and Social Psychology, 85*, 163–178. https://doi.org/10.1037/0022-3514.85.1.163

Fung H. H., Carstensen L. L. (2004). Motivational changes in response to blocked goals and foreshortened time: testing alternatives for socioemotional selectivity theory. *Psychology and Aging 19*, 68–7810.1037/0882-7974.19.1.68

Fung, H.H., Carstensen, L.L., & Lutz, A.M. (1999). Influence of time on social preferences: Implications for life-span development. *Psychology and Aging, 14*, 595-604. https://doi.org/10.1037/0882-7974.14.4.595

Goldberg, J. H., Breckenridge, J. N., & Sheikh, J. I. (2003). Age differences in symptoms of depression and anxiety: Examining behavioral medicine outpatients. *Journal of Behavioral Medicine, 26*, 119–132. https://doi.org/10.1023/A:1023030605390

Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Skorpen, C. G., & Hsu, A. Y. C. (1997). Emotion and aging: Experience, expression, and control. *Psychology and Aging*, *12*, 590–599. https://doi.org/10.1037/0882-7974.12.4.590

Gross, J. J., Richards, J. M., & John, O. P. (2006). Emotion regulation in everyday life. In *Emotion regulation in couples and families: Pathways to dysfunction and health* (Snyder, Douglas K. (Ed); Simpson, Jeffry (Ed); Hughes, Jan N. (Ed)., pp. 13–35). Washington, DC, US: American Psychological Association.

Grühn, D., Kapkin, E., & Sharifian, N. (2015). *Affective Image Database (AID). Technical report A.* Raleigh, NC: North Carolina State University.

Grühn, D., Sharifian, N., & Chu, Q. (2016). The limits of a limited future time perspective in explaining age differences in emotional functioning. *Psychology and Aging*, *31*, 583–593. https://doi.org/10.1037/pag0000060

Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: A dual-process framework. *Cognition and Emotion*, *25*, 400–412. https://doi.org/10.1080/02699931.2010.544160

Hasher, L., & Zacks, R. T. (1988). Working memory, comprehension, and aging: A review and a new view. In *The psychology of learning and motivation* (In G.H. Bower (Ed.), Vol. 22, pp. 193–225). San Diego, CA: Academic Press.

Hart, S. G., & Staveland, L. E. (1988). Development of NASA-TLX (task load index): Results of empirical and theoretical research. In *Human Mental Workload* (P.A. Handcok and N. Meshkati (Eds.)). Amsterdam: North Holland Press.

Hayes, A.F. (2009). Beyond baron and kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408-420. https://doi.org/10.1080/03637750903310360.

Hess, T.M., Osowski, N.L., Leclerc, C.M. (2005). Age and expertise influences on the complexity of social inferences. *Psychology and Aging, 20*, 447-459. https://doi.org/10.1037/0882-7974.20.3.447

Hu, L., & Bentler, P.M. (1998). Fit indices in covariance structure modeling: Sensitivity to under-parameterized model misspecification. *Psychological Methods, 3*, 424-453.

Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Isaacowitz, D. M. (2006). Motivated gaze: The view from the gazer. *Current Directions in Psychological Science*, *15*, 68–72. https://doi.org/10.1111/j.0963-7214.2006.00409.x

Isaacowitz, D.M., Wadlinger, H.A., Goren, D., & Wilson, H.R. (2006). Selective preference in visual fixation away from negative images in old age? An eye-tracking study. *Psychology and Aging, 21*, 40-48. https://doi.org/10.1037/0882-7974.21.1.40

John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences and life span development. *Journal of Personality, 72*, 1302–1334. https://doi.org/10.1111/j.1467-6494.2004.00298.x

Kessler, E., & Staudinger, U. (2009). Affective experience in adulthood and old age: The role of affective arousal and perceived affect regulation. *Psychology and Aging*, *24*, 349–362. https://doi.org/10.1037/a0015352 349

Kim, Y., Deci, D.L., & Zuckermann, M. (2002). The development of the self-regulation of withholding negative emotions questionnaire. *Educational and Psychological Measurement, 62*, 316-336. https://doi.org/ 10.1177/0013164402062002008

Kooij, D., de Lange, A.H., Jansen, P.G.W., & Dikkers, J.S.E. (2013). Beyond chronological age. Examining perceived future time and subjective health as age-related mediators in relation to work-related motivations and well-being. An International *Journal of Work, Health and Organisations*, (27), 88-105. https://doi.org/ 10.1080/02678373.2013.769328

Kuhl, J., & Beckmann, J. (1994). Action versus state orientation: Psychometric properties of the Action Control Scale (ACS-90). In J. Kuhl & J. Beckmann (Eds.), *Volition and personality* (pp. 47–59). Goettingen, Germany: Hogrefe.

Kotter-Grühn, D., & Smith, J. (2011). When time is running out: Changes in positive future perception and their relationships to changes in wellbeing in old age. *Psychology and Aging, 26*, 381–387. http://dx.doi.org/10.1037/a0022223

Kunzmann, U., & Grühn, D. (2005). Age differences in emotional reactivity: The sample case of sadness. *Psychology and Aging, 20,* 47–59.http://dx.doi.org/10.1037/0882-7974.20.1.47

Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging, 17,* 125–139. https://doi.org/10.1037//0882-7974.17.1.125

Lawton, M. P., Kleban, M. H., Rajagopal, D., & Dean, J. (1992). Dimensions of affective experience in three age groups. *Psychology and Aging, 7,* 171–184. https://doi.org/10.1037/0882-7974.7.2.171

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9,* 151–173. http://dx.doi.org/10.1207/S15328007SEM0902_1

Lohani, M. & Isaacowitz, D.M., (2014). Age differences in managing response to sadness elicitors using attentional deployment, positive reappraisal and suppression. *Cognition and Emotion, 4,* 678-697. https://doi.org/10.1080/02699931.2013.853648

Luong, G., & Charles, S.T. (2014). Age differences in affective and cardiovascular responses to a negative social interaction: The role of goals, appraisals, and emotion regulation. *Developmental Psychology, 50,* 1919-1930. https://doi.org/10.1037/a0036621

Magai, C., Consedine, N.S., Krivoshekova, Y.S., Kudadjie-Gyamfi, E., & McPherson, R. (2006). Emotional experience and expression across the adult life span: Insights from a multimodal assessment study. *Psychology and Aging, 21,* 303-317. https://doi.org/10.1037/0882-7974.21.2.303

Martins, B., Sheppes, G., Gross, J. J., & Mather, M. (2016). Age differences in emotion regulation choice: Older adults use distraction less than younger adults in high-intensity positive contexts. *Journals of Gerontology: Psychological Sciences*, *00*, 1–9. https://doi.org/10.1093/geronb/gbw028

Mathers, M. & Carstensen, L.L. (2003). Aging and attentional biases for emotional faces. *Psychological Science, 14*, 409-415. https://doi.org/ 10.1111/1467-9280.01455

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the intrinsic motivation inventory in a competitive sporting setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60*, 48–58.

Mroczek, D. K., & Spiro III, A. (2005). Change in life satisfaction during adulthood: Findings from the veterans affairs normative aging study. *Journal of Personality and Social Psychology*, *88*, 189–202. https://doi.org/10.1037/0022-3514.88.1.189

Noh, S. R., Lohani, M., & Isaacowitz, D. M. (2011). Deliberate real-time mood regulation in adulthood: The importance of age, fixation and attentional functioning. *Cognition and Emotion*, *25*, 998–1013. https://doi.org/10.1080/02699931.2010.541668

Old, S. R., & Naveh-Benjamin, M. (2009). Age-related changes in memory: Experimental approaches. In *Handbook of Cognitive Aging: Interdisciplinary Perspectives* (Scott M. Hofer & Duane F. Alwin (Eds.), pp. 151–167). Sage.

Paolacci, G., & Chandler, J. (2014). Inside the turk: Understanding mechanical turk as a participant pool. Current Directions in Psychological Science, 23, 184-188. https://doi.org/ 10.1177/0963721414531598

Phillips, L. H., Henry, J. D., Hosie, J. A., & Milne, A. B. (2008). Effective regulation of the experience and expression of neg ative affect in old age. *Journal of Gerontology: Psychological Sciences, 63B*, 138–145. https://doi.org/10.1093/geronb/63.3.P138

Popham, L. E., & Hess, T. M. (2014). *Age differences in the regulation of subjective emotional and psychological responses to a social-evaluative stressor* (Disseration). North Carolina State University, Raleigh, NC.

Reed, A., & Carstensen, L. (2012). The theory behind the age-related positivity effect. *Frontiers in Psychology*, *3*. https://doi.org/10.3389/fpsyg.2012.00339

Richards, J., & Gross, J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79*(3), 410–424. https://doi.org/I0.I037//0022-3514.79.3.410

Ryan, R. M. (1992). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology, 45*, 736–750.

Salthouse, T. A. (2006). Mental exercise and mental aging: Evaluating the validity of the "use it or lose it" hypothesis. *Perspectives on Psychological Science, 1*, 68–87.

Scheibe, S., & Blanchard-Fields, F. (2009). Effects of regulating emotions on cognitive performance: What is costly for young adults is not so costly for older adults. *Psychology and Aging, 24*, 217–233. https://doi.org/10.1037/a0013807

Scheibe, S., Sheppes, G., & Staudinger, U. M. (2015). Distract or reappraise? Age-related differences in emotion regulation choice. *Emotion, 15*, 677–681. https://doi.org/10.1037/a0039246

Schilling, O.K. & Diehl, M. (2014). Reactivity to stressor pile-up in adulthood: Effects on daily negative and positive affect. *Psychology and Aging, 29,* 72-83. https://doi.org/10.1037/a0035500

Schilling, O.K. & Diehl, M. (2015). Psychological vulnerability to daily stressors in old age: Results of short-term longitudinal studies. *Zeitschrift für Gerontologie und Geriatrie, 48,* 517-523. https://doi.org/ 10.1007/s00391-015-0935-7

Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-regulation choice. *Psychological Science, 22,* 1391–1396. https://doi.org/10.1177/0956797611418350

Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: A conceptual framework and supporting evidence. *Journal of Experimental Psychology: General, 143,* 163–181. https://doi.org/10.1037/a0030831

Shiota, M., & Levenson, R. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging, 24,* 890–900. https://doi.org/10.1037/a0017896

Shrout, P.E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7,* 422-445. https://doi.org/10.1037//1082-989X.7.4.422

Sze, J.A., Gyurak, A., Goodkind, M.S., & Levenson, R.W. (2012). Greater emotional empathy and prosocial behavior in later life. *Emotion, 12,* 1129-1140. https://doi.org/10.1037/a0025011

Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current Directions in Psychological Science, 19,* 352–357. https://doi.org/10.1177/0963721410388395

Watson, D., Clark, L. A., & Tellegen, http://dx. doi. org. prox. lib. ncsu. edu/10. 1037/002.-3514. 54. 6. 106. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070. https://doi.org/http://doi.org /10.1037/0022- 3514.54.6.1063

Whitehead, B.R., & Bergeman, C.S. (2013). Ups and downs of daily life: Age effects on the impact of daily appraisal variability on depressive symptoms. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 69*, 387-396. https://doi.org/10.1093/geronb/gbt019

APPENDICES

Appendix A

Appendix B

Table 2.
Descriptive Statistics for Age, Motivation-Relevant Components and Well-Being.

	M	*SD*
Age	45.01	16.13
FTP	4.44	1.39
Positive Affect	4.90	1.14
Negative Affect	1.98	1.07
Autonomous Regulation	4.98	1.10
Controlled Regulation	4.07	1.21
Engaging	60.64%	26.36%
Disengaging	29.88%	24.82%
No Regulation	9.36%	15.63%
Arousal	4.79	0.98
Valence	4.43	1.22
Difficulty	3.52	1.27
Effort	6.02	1.05
Competence	5.04	1.29

Note. FTP = future time perspective, Valence = mean across all images, Arousal = mean across all images, Difficulty = mean across all images, Effort = subscale of the IMI, Competence = IMI competence and NASA performance mean.

Appendix C

Table 3.
Correlations among Age, Motivation-relevant Components and Well-Being

	1	2	3	4	5	6	7	8	9	10	11
1. Age											
2. FTP	-.25***										
3. Effort	.36***	.07									
4. Comp	-.02	.09	.36***								
5. Perform	.06	.19**	.46***	.65***							
6. Difficulty	.06	.05	.12	-.09	-.01						
7. Engage	.10	.08	.06	.10	.15	-.58***					
8. Disengage	-.19**	-.04	-.21**	-.13	-.16*	.37***	-.82***				
9. Valence	.11	-.02	.24**	-.04	.04	.68***	-.38***	.23***			
10. Arousal	.06	-.05	.18*	-.01	.04	.74***	-.46***	.31***	.85***		
11. AR	.44***	.06	.37***	.06	.11	.08	-.03	-.04	.12	.08	
12. CR	-.01	-.17*	.04	.09	-.02	.20***	-.19**	.14	.16*	.21**	.47***

Note. * = p < .05, ** = p < .01, *** = p < .001, FTP = future time perspective, Comp = perceived competence, perform = perceived successful performance, Engage = % of engaging strategies selected, Disengage = % of disengaging strategies selected, Difficulty = mean across all images, Valence = mean across all images, Arousal = mean across all images, AR = Autonomous Regulation, CR = Controlled Regulation.

Appendix D

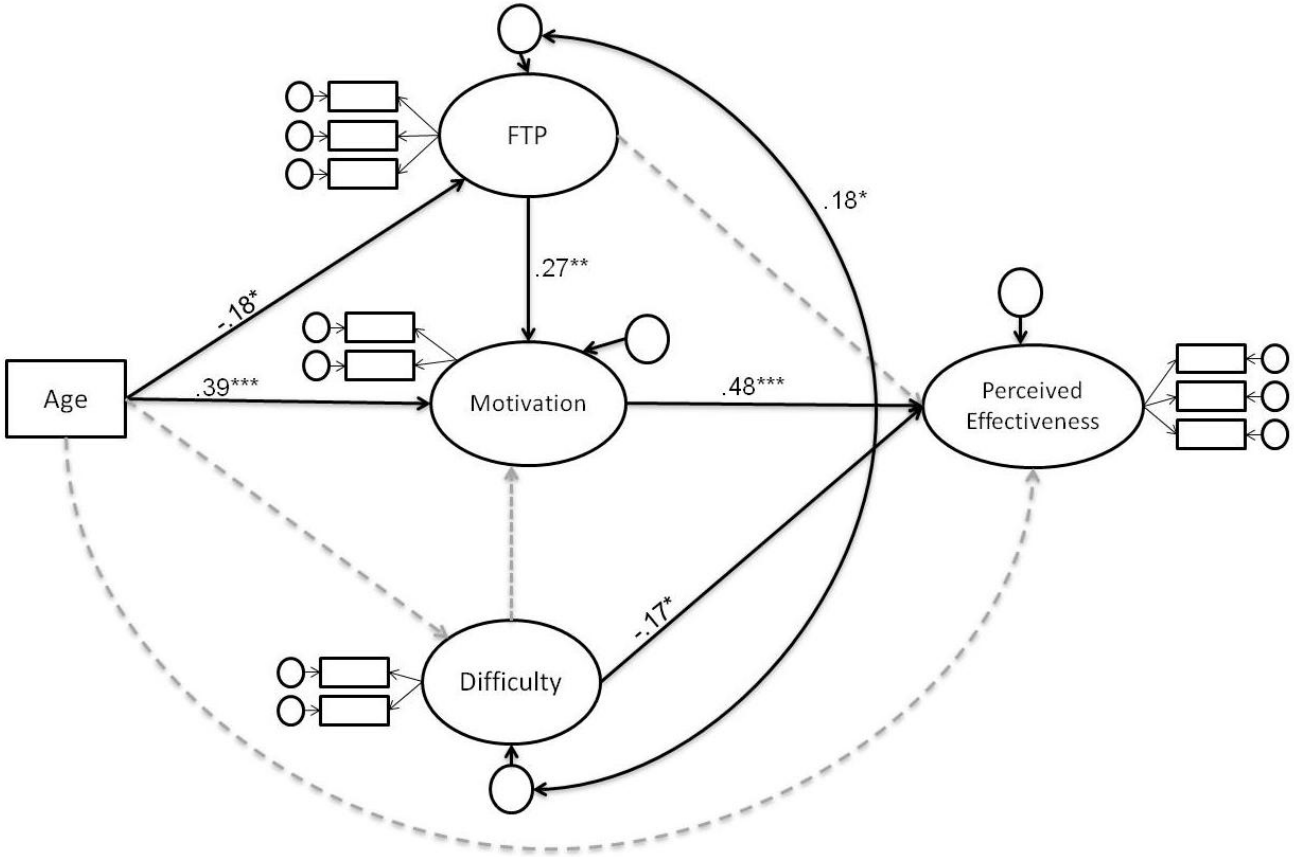

Figure 1. Structural equation model with future time perspective (FTP), chronological age, motivation, and subjective difficulty as predictors for perceived effectiveness for the emotion regulation task. Displayed values are significant standardized regression weights. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figure.

Appendix E

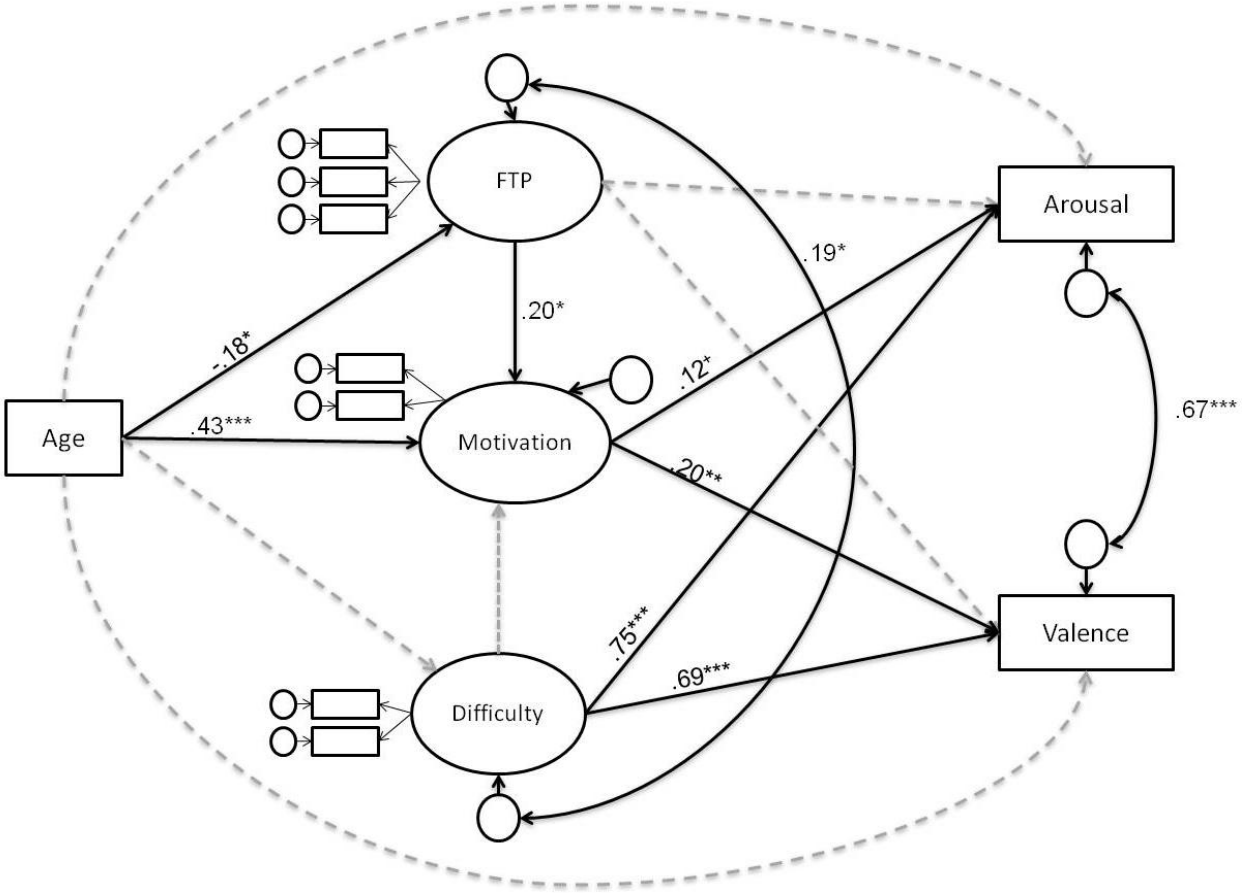

Figure 2. Structural equation model with future time perspective (FTP), chronological age, motivation, and subjective difficulty as predictors for actual effectiveness (valence and arousal). Displayed values are significant standardized regression weights. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figure.

Appendix F

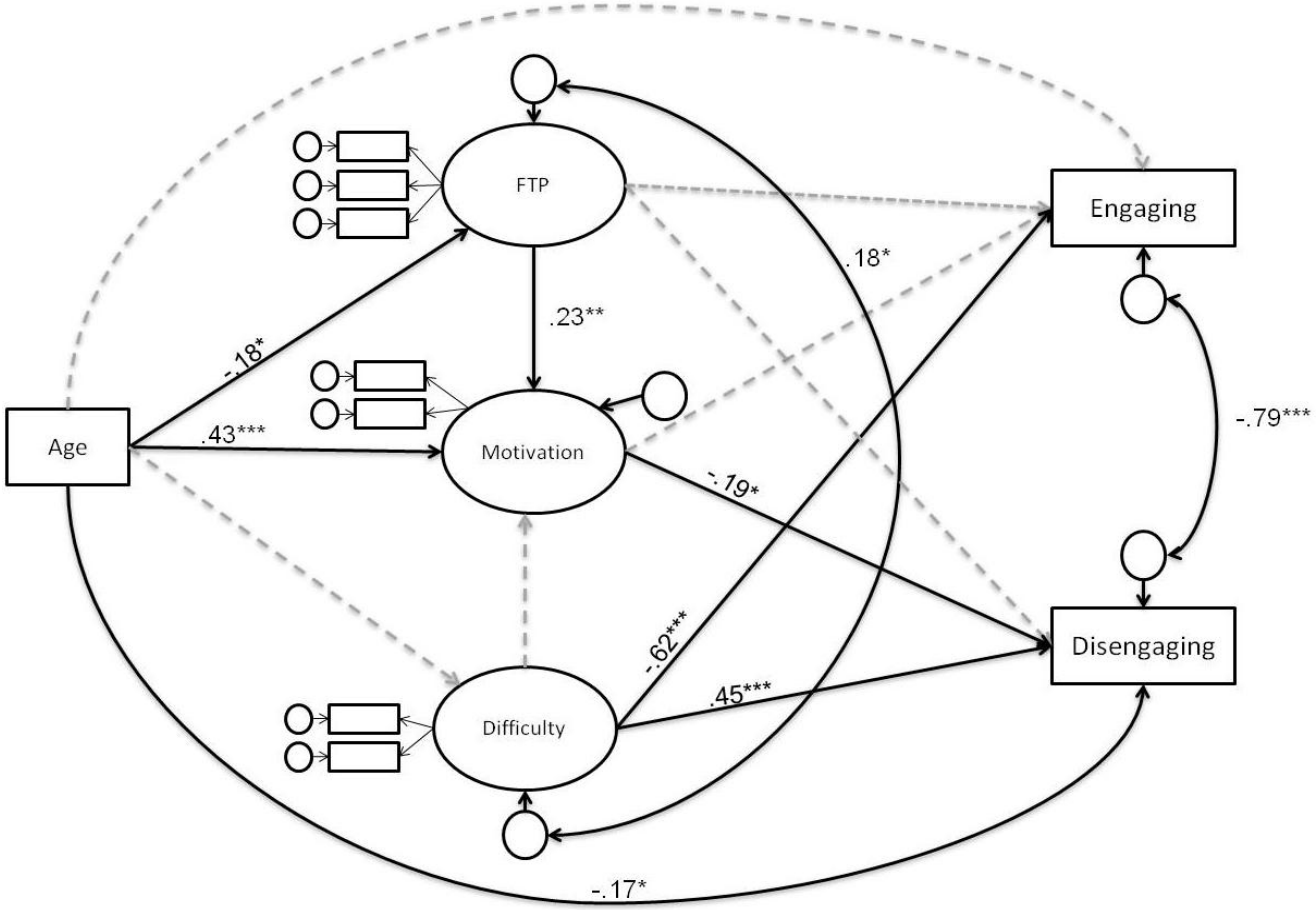

Figure 3. Structural equation model with future time perspective (FTP), chronological age, motivation, and subjective difficulty as predictors for strategy selection (Engaging and Disengaging). Displayed values are significant standardized regression weights. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figure.

Appendix G

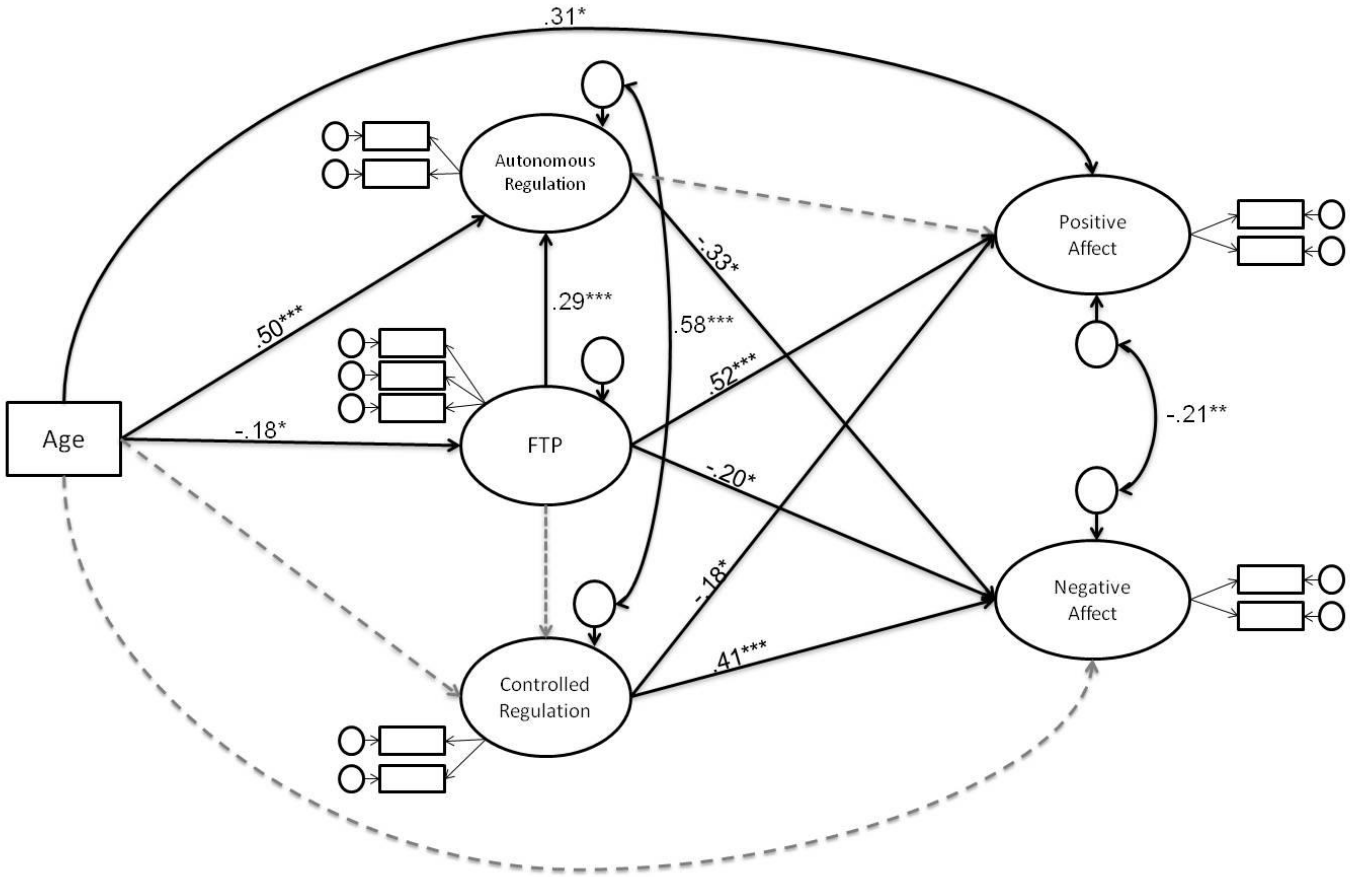

Figure 4. Structural equation model with future time perspective (FTP), chronological age, autonomous and controlled regulation as predictors for positive and negative affect. Displayed values are significant standardized regression weights. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figure.

Appendix H

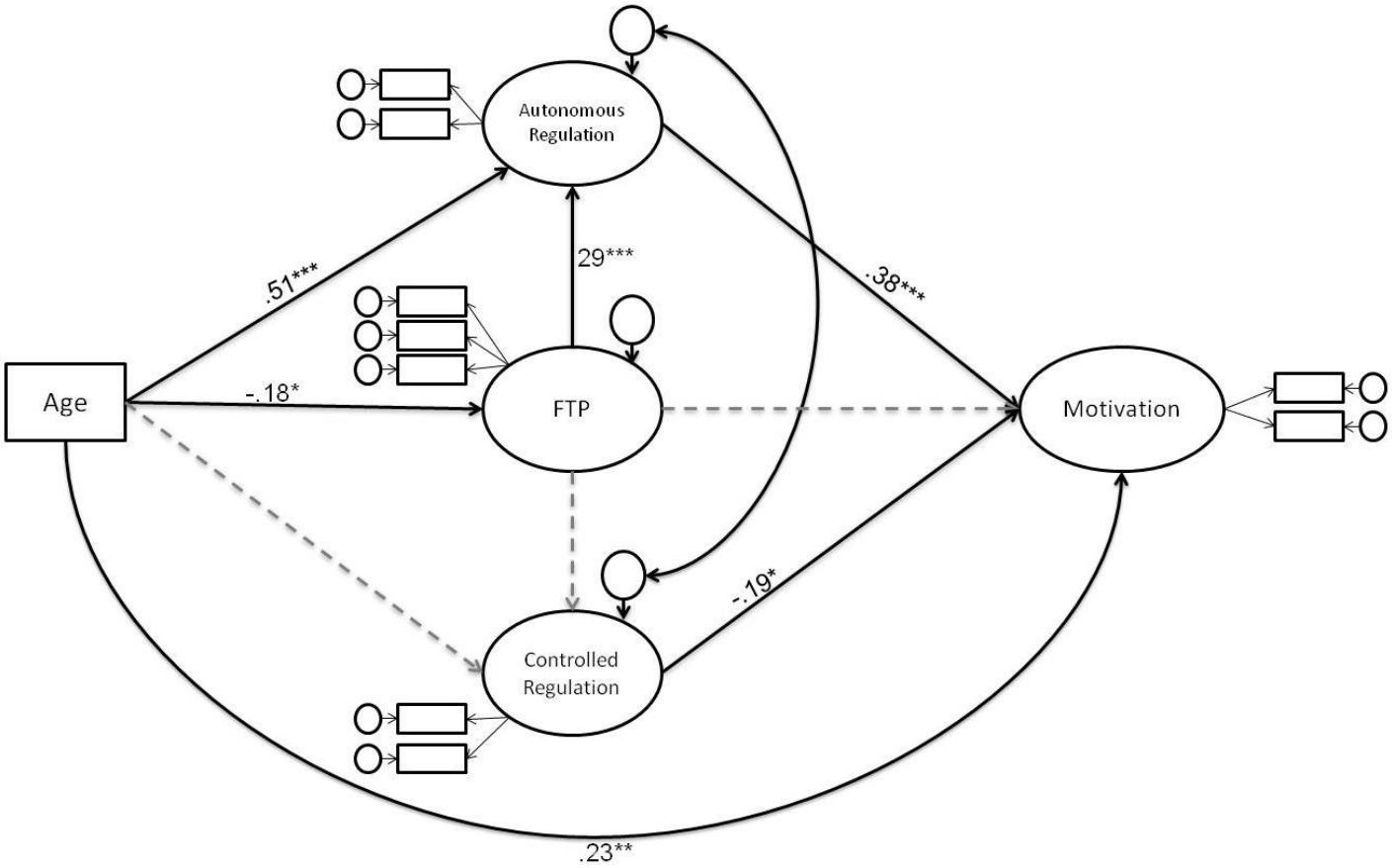

Figure 5. Structural equation model with future time perspective (FTP), chronological age, autonomous and controlled regulation as predictors for motivation (effort) for the emotion regulation task Displayed values are significant standardized regression weights. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figure.

Appendix I

Background Questionnaire

1. What is your date of birth? (mm/dd/yyyy) _____/_____/_____

2. What is your sex? (check one)
    a. Male
    b. Female
    c. Other

3. What is your gender identity?
    a. Cis-gender (same as your biological sex)
    b. Transgender (different from your biological sex)

4. Which do you feel best describes your racial background? (Multiple answers are possible)
    a. White and/or European-American
    b. Black and/or African-American
    c. Hispanic, Spanish, or Latino
    d. Asian
    e. Native American or Alaska Native
    f. Middle Eastern or North African
    g. Native Hawaiian or Pacific Islander
    h. Other

5. What is your highest degree you have received?
    a. High school diploma or equivalency (GED)
    b. Bachelor's Degree
    c. Master's Degree
    d. Doctorate (e.g., PhD, MD, JD, EdD, PsyD)
    e. Other

6. What is your current employment status? (Multiple answers are possible)
    a. Working full-time
    b. Working part-time
    c. In training/education (e.g., student)
    d. Retired or Retired on disability
    e. Unemployed or laid off
    f. Keeping house or raising children full-time
    g. Other

7. Marital Status: Are you currently:

a. Single, never married
b. Married, or living in a long-term relationship
c. Divorced, not remarried
d. Widowed, not remarried

8. Overall, how satisfied are you with your life?

extremely unsatisfied			average			extremely satisfied
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

9. Overall, how would you rate your physical health?

poor			good			excellent
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

10. Compared to other people of your age, your physical health is?

much worse			similar			much better
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

11. How old are you currently in years?

Appendix J

Positive Affect and Negative Affect Schedule (PANAS)

Please indicate how well each statement describes you generally.
1=very rarely; 7=very frequently

In general, I am…	Very rarely 1-------2-------3-------4-------5-------6-------7	Very frequently
1) attentive	O-------O------O-------O------O------O------O	
2) strong	O-------O------O-------O------O------O------O	
3) irritable	O-------O------O-------O------O------O------O	
4) inspired	O-------O------O-------O------O------O------O	
5) afraid	O-------O------O-------O------O------O------O	
6) alert	O-------O------O-------O------O------O------O	
7) upset	O-------O------O-------O------O------O------O	
8) active	O-------O------O-------O------O------O------O	
9) guilty	O-------O------O-------O------O------O------O	
10) nervous	O-------O------O-------O------O------O------O	
11) excited	O-------O------O-------O------O------O------O	
12) hostile	O-------O------O-------O------O------O------O	
13) proud	O-------O------O-------O------O------O------O	
14) jittery	O-------O------O-------O------O------O------O	
15) ashamed	O-------O------O-------O------O------O------O	
16) scared	O-------O------O-------O------O------O------O	
17) enthusiastic	O-------O------O-------O------O------O------O	
18) distressed	O-------O------O-------O------O------O------O	
19) determined	O-------O------O-------O------O------O------O	
20) interested	O-------O------O-------O------O------O------O	

Appendix K

Future Time Perspective Questionnaire

	Strongly Disagree 1--------2-------3-------4-------5-------6-------7 Strongly Agree
1) Many opportunities await me in the future.	O-------O------O-------O------O------O------O
2) I expect that I will set many new goals in the future.	O-------O------O-------O------O------O------O
3). My future is filled with possibilities.	O-------O------O-------O------O------O------O
4) Most of my life lies ahead of me	O-------O------O-------O------O------O------O
5) My future seems infinite to me.	O-------O------O-------O------O------O------O
6) I could do anything I want in the future.	O-------O------O-------O------O------O------O
7) There is plenty of time left in my life to make new plans.	O-------O------O-------O------O------O------O
8) I have the sense time is running out.	O-------O------O-------O------O------O------O
9) There are only limited possibilities in my future.	O-------O------O-------O------O------O------O
10) As I get older, I begin to experience time as limited.	O-------O------O-------O------O------O------O

Appendix L

Intrinsic Motivation Inventory

	Strongly Disagree 1-------2-------3-------4-------5-------6-------7 Strongly Agree
1) I enjoyed doing this activity very much	O-------O------O-------O------O------O------O
2) I think I am pretty good at this activity	O-------O------O-------O------O------O------O
3) I did this activity because I had to	O-------O------O-------O------O------O------O
4) I felt very tense while doing this activity	O-------O------O-------O------O------O------O
5) I put a lot of effort into this	O-------O------O-------O------O------O------O
6) I would describe this activity as very interesting	O-------O------O-------O------O------O------O
7) I didn't really have a choice about doing this task	O-------O------O-------O------O------O------O
8) I was pretty skilled at this activity	O-------O------O-------O------O------O------O
9) I was pretty anxious while working on this task	O-------O------O-------O------O------O------O
10) I felt like it was not my own choice to do this task	O-------O------O-------O------O------O------O
11) I felt pressured while doing this task	O-------O------O-------O------O------O------O
12) This was an activity that I couldn't do very well	O-------O------O-------O------O------O------O
13) This activity was fun to do	O-------O------O-------O------O------O------O
14) I didn't try very hard to do well on this activity	O-------O------O-------O------O------O------O
15) I am satisfied with my performance on this task	O-------O------O-------O------O------O------O
16) This activity did not hold my attention at all	O-------O------O-------O------O------O------O
17) I felt like I had to do this activity	O-------O------O-------O------O------O------O
18) I did this activity because I wanted to	O-------O------O-------O------O------O------O
19) I tried very hard on this activity	O-------O------O-------O------O------O------O

20) After working on this activity for awhile, I felt pretty competent	O-------O------O-------O------O------O------O
21) I believe I had some choice about doing this activity	O-------O------O-------O------O------O------O
22) I didn't put much energy into this activity	O-------O------O-------O------O------O------O
23) I did this activity because I had no choice	
24) I thought this was a boring task	O-------O------O-------O------O------O------O
25) I think I did pretty well at this activity compared to other people.	O-------O------O-------O------O------O------O
26) I was very relaxed while doing this activity	O-------O------O-------O------O------O------O
27) I thought this activity was quite enjoyable	O-------O------O-------O------O------O------O
28) It was important to me to do well at this task	O-------O------O-------O------O------O------O
29) While I was doing this activity, I was thinking about how much I enjoyed it	O-------O------O-------O------O------O------O
30) I did not feel nervous at all while doing this activity	O-------O------O-------O------O------O------O

Appendix M

NASA-TLX

Mental Demand

How mentally demanding was the task?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Physical Demand

How physically demanding was the task?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Temporal Demand

How hurried or rushed was the pace of the task?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Performance

How successful were you in accomplishing what you were asked to do?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Effort

How hard did you have to work to accomplish your level of performance?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Frustration

How insecure, discouraged, irritated, stressed or annoyed were you?

Very Low	Very High
O ---------- O ---------- O ---------- O ---------- O ---------- O ---------- O	

Appendix N

Post Image Questionnaire

1. During the presentation of the previous image, I felt…

Relaxed						Tense
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

2. During the presentation of the previous image, I felt…

Very Positive						Very Negative
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

3. To regulate my emotions while viewing the previous image, I…
    a. tried to view the positive side of the situation
    b. tried to view the image in an unemotional way
    c. looked away from the negative parts of the image or closed my eyes
    d. tried to think about something else besides the image
    e. could not regulate my emotions
    f. Other, please specify:_____

4. How difficult was it for you to regulate your emotions?

Not at all difficult		Somewhat difficult				Extremely difficult
O ----------	O ----------	O ----------	O ----------	O ----------	O ----------	O

5. What emotion(s) best describe the previous image to you?
    a. sad
    b. angry
    c. scary
    d. disgusting
    e. other, please specify:_____