

THE IMPORTANCE OF EMOTIONAL AWARENESS FOR UNDERSTANDING  
DEPRESSION AND LIFE SATISFACTION ACROSS THE ADULT LIFESPAN

BY

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DISSERTATION

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## **ABSTRACT**

Traditional views of well-being include the direct experience of emotion, but rarely consider affective factors outside of direct emotional experiences. Emotional awareness involves the meta-cognitive monitoring, evaluation, and judgment one makes about their emotions. To the extent that emotions provide useful information about one's goals and goal progress, being able to understand that information should facilitate goal attainment and promote psychological well-being and mental health. Therefore, the present research tests ways in which emotional awareness may contribute to psychological well-being across the adult lifespan. Study 1 indicated that emotional and goal clarity are separable constructs both linked to depression and life satisfaction. Furthermore, emotional clarity appears to increase linearly from young adulthood into older adulthood. Study 2 showed that age, depression, and life satisfaction were only weakly associated with emotion differentiation. However, emotion differentiation moderated the links between mean-level affect and psychological well-being outcomes. Implications for aging research and clinical intervention are discussed.

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## TABLE OF CONTENTS

CHAPTER 1: GENERAL INTRODUCTION .....	1
CHAPTER 2: CLARITY OF EMOTIONS AND GOALS: EXPLORING ASSOCIATIONS WITH WELL-BEING ACROSS ADULTHOOD (STUDY ONE).....	8
CHAPTER 3: DO MEAN-LEVELS OF NEGATIVE AND POSITIVE AFFECT TELL US EVERYTHING WE NEED TO KNOW? THE ROLE OF EMOTION DIFFERENTIATION IN PSYCHOLOGICAL WELL-BEING (STUDY TWO) .....	33
CHAPTER 4: GENERAL DISCUSSION .....	64
REFERENCES .....	70
APPENDIX A: STUDY ONE SUPPLEMENTAL MATERIALS .....	93
APPENDIX B: STUDY TWO SUPPLEMENTAL MATERIALS.....	109

## CHAPTER 1: GENERAL INTRODUCTION

Diener (1984) proposed that subjective well-being is constructed from the pleasant emotional experiences one has, the absence of unpleasant emotional experiences, and an overall, global judgment of one's life. Life satisfaction, the global evaluation one makes about their life, is such a strong indicator of subjective well-being that national level data on life satisfaction has been used to inform policy (Diener et al., 2013). No definitive developmental trajectory of life satisfaction across adulthood has been observed (Baird et al., 2010). It is generally thought that life satisfaction follows a U-shaped curve, where it is high in younger adulthood, dips in middle adulthood, increases into older adulthood, and finally drops steeply right before the end of life (Baird et al., 2010; Jivraj et al., 2014; Cheng et al., 2015). In the nascency of this model of subjective well-being, it was not clear how these different components were related to each other (Diener, 1984). In the decades since, it has been shown that life satisfaction is robustly, but non-redundantly, linked to positive and negative affect (Suh et al., 1998; Schimmack, 2006). The accumulation of these hedonic experiences contributes to the judgment that one's life is more satisfying (Suh et al., 1998).

In contrast to life satisfaction, depression is a prevalent, distressing disorder involving disturbances in emotion, energy, cognition, and motivation. While depression can afflict people at any age, among adults, it is most prevalent (13.1%; World Health Organization [WHO], 2017) in younger adults (i.e., 18-25). Older adults (i.e., adults over 60) generally experience increases in emotional health (Carstensen et al., 2003). However, older adults also have high prevalence rates of depression with estimated rates around 7% (WHO, 2017). Disturbingly, approximately half of cases of depression in older adults are first-time episodes (Fiske et al., 2009). Therefore, depression is a problem spanning adulthood. While more young adults may experience

depression at higher overall rates, older adults represent a group who potentially experience the best or worst emotional health in their lifetime. Across decades of research, depression has been robustly linked to decreased positive affect and increased negative affect (Watson et al., 1988; Clark & Watson, 1991; Shankman & Klein, 2003).

Despite the emphasis on positive and negative affect in the extant well-being literature, these are not the only affective experiences that contribute to well-being. One reason for this is that individuals differ in their meta-cognitive experience of their emotions. For some, emotions are confusing and blend together, making the experience of even pleasant emotions uncomfortable. The longstanding conceptualization of subjective well-being treats positive affect as uniformly desirable and negative affect as undesirable, leaving little room for individual differences in how people relate to their emotional experiences. The present work takes the perspective that factors related to our emotions, but outside the direct experience of them, have relevance for well-being and mental health. I begin by describing the guiding philosophy and premises for my program of research, including: (1) what an emotion is; (2) how emotions and goals are connected; and (3) the role of emotions and goals in psychological well-being. I finish by proposing the current research.

### **What is an emotion?**

Emotions, broadly defined, are loosely coordinated episodes of subjective, physiological, and behavioral changes in response to a stimulus (Frijda, 1988). Emotions are distinguishable from other affective phenomena such as drives or moods. Drives, like hunger, regulate the body's homeostatic needs (Buck, 1985). Moods involve similar components to emotions, such as bodily, cognitive, and behavioral changes, but are not tied to specific stimuli, as is the case with emotions. Therefore, moods are more diffuse, less intense, and tend to last longer than emotions

(Larsen, 2000). A primary question of emotion theory is how to organize these experiences. Emotions are thought to follow superordinate dimensions, such as valence (whether they feel pleasant/pleasurable or unpleasant/painful) and arousal (how activating they feel in the body) (Russell, 1980). However, emotions are far more than just valence and arousal. Emotions involve an appraisal of the eliciting stimulus or situation (Ortony et al., 1988; Lazarus, 1982; Moors et al., 2013), which transforms experiences of pleasantness/pleasure or unpleasantness/pain into an emotional experience. Individuals differ in how they appraise the same emotion-eliciting stimuli (Siemer et al., 2007), leading to individuals having different cognitive, subjective feeling, behavioral, and physiological responses to the same situation. Specific emotions are further connected to action readiness (Frijda, 1988), or motivation to approach or avoid, and action tendencies (Frijda, 1986; Scherer, 1988), or patterns of behavior characteristic of that emotion. Thus, emotions involve judgments of our situation or environment, which further organize action or plans to act.

### **Do emotions have a purpose?**

Historically, western philosophy has treated emotion as a functionless phenomenon of the human experience (Solomon, 2008). An even more extreme stance is that emotions are not just functionless, but actually work in stark contrast to thought and reason, creating a disruption in thinking or behavior (Skinner, 1948, as cited in Keltner & Gross, 1999). If emotions are not useful, why have they persisted through several million years of human evolution? It is possible that emotions are a phenomenological equivalent to the appendix—a remnant of humans' evolutionary past. However, from the perspective of evolutionary theory, if emotions are a mistake or useless, or even work against adaption and survival, they would have been selected out over the millions of years of human development. From a socio-cultural perspective,

emotions help to organize acceptable ways of expressing oneself and behaving around other people (Matsumoto et al., 2008; Tsai et al., 2006). Finally, from the perspective of the past 40 years of psychological theory and research on emotion, there is abundant evidence that emotions, in most contexts (Fridja, 1994), serve a purpose. Thus, a fundamental premise of the current research is that emotions serve important functions for organizing behavior and adjusting to the demands of one's environment. At the core of the functionalist perspective of emotions is the idea that emotions are themselves adaptations to the problems and challenges that humans encounter in their daily lives.

### **Goals and emotions**

As humans, our behavior is directed by goals (internal representations of desired states; Austin & Vancouver, 2000). Though evolution emphasizes human survival as our primary goal, we have developed core psychological needs (e.g., a need for affiliation, predictability, competence) that are organized around the promotion of psychological well-being (Dweck, 2017). Dweck (2017) proposes that our day-to-day goals stem from core psychological needs and the fulfillment of those goals promotes our psychological well-being. When our goals/needs are met, pleasant emotion is elicited. When our goals/needs are not being met, unpleasant emotion is elicited. Emotions can serve as a barometer of whether our goals are being met or whether we are moving closer or further away from meeting our goals (Carver & Scheier, 1990; Larsen, 2000). The accumulation of emotional experiences (i.e., the individual differences in the levels of emotions typically felt), which in part should reflect the accumulation of our psychological needs and goals being met, serves as an indicator of our subjective well-being (Diener, 1984).

Emotions can serve further functions of motivating us to be more successful in our goals (Tamir, 2009). Anger is elicited when we are blocked from our goals and can help focus our



attention on our desired outcome (Carver & Harmon-Jones, 2009). In a competitive situation, getting angry can help one singularly focus on winning, thereby facilitating goal attainment (Tamir et al., 2008). In contrast, excitement may similarly activate the body, but not focus the mind and one's actions on the desired outcome. Thus, emotions do not just passively reflect whether we are being successful in goal pursuit, but can also work to facilitate goal success.

Whereas an emotion itself may arise as a reaction to environmental demands or challenges, the felt experience of the emotion acts as a signal that something in the environment is important or salient (Damasio, 2004; Clore et al., 2018). The affect-as-information approach (Clore et al., 2001; Gohm & Clore, 2002a; Gohm, 2003; Storbeck & Clore, 2008) suggests that our affective (e.g., emotional, mood, liking/disliking) reactions provide salient information about a range of important considerations, such as our environment, situation, and/or goal progress. On one hand, affect-as-information has been used to explain how affective reactions can shape reasoning outside conscious awareness (e.g., rating one's life as less satisfying on a rainy day; Schwarz & Clore, 1983; Schwarz & Clore, 2003; Messner & Wanke, 2011). However, to the extent a person understands the information provided by their affective experiences, it is possible to use that information to work towards goal pursuit.

### **Emotional awareness and the present research**

Emotional awareness is one's meta-cognitive dispositions towards attending to/valuing emotions, understanding the emotions one feels, and distinguishing among the emotions one feels (Gohm & Clore, 2000; Mankus et al., 2015; Boden & Thompson, 2017; Eckland et al., 2021). The present work focuses on two facets of emotional awareness in particular: (a) emotional clarity, the extent to which one can unambiguously identify and describe their feelings (Gohm & Clore, 2000); and (b) emotion differentiation, the extent to which one distinguishes

among the mental representations of the emotions they feel (Barrett et al., 2001). Understanding one's emotions has been shown to facilitate problem solving and more actively coping with the stressors in one's day-to-day life (Gohm et al., 2003; Baker & Berenbaum, 2007; Eckland & Berenbaum, 2021). Differentiating among one's emotions has been linked to greater range and success of emotion regulation in daily life (Barrett et al., 2001).

The present research is guided by the following premises: (1) psychological well-being is promoted by goal attainment; (2) emotions arise as responses to environmental challenges and serve as indicators of our success in goal attainment; (3) emotions can serve to facilitate goal attainment; and (4) understanding of affective information should promote well-being by providing individuals with information that can be used for successful goal attainment. Therefore, the present research tests ways in which emotional awareness may contribute to psychological well-being across the adult lifespan. In Study 1, the relationship between emotional clarity and understanding of one's goals is explored in relation to life satisfaction and depression, in a samples of young, middle, and older adults (ranging from 18 to 81 years old). Since older adults tend to experience greater emotional health (Carstensen et al., 2000; Carstensen et al., 2003), many emotion regulatory explanations for the increases in emotional health adults have been proposed. However, these explanations focused on emotion regulation have been largely unsupported by empirical data. Study 1 tests an alternative explanation-- Older adults do not necessarily regulate their emotions differently, but have greater knowledge and understanding of their emotions which promotes successful emotional goal attainment. In Study 2, emotion differentiation is explored in the context of age in four large samples of adults (ranging from 18 to 93 years old). Study 2 further examines for whom emotion differentiation predicts psychological well-being (life satisfaction and depression). These studies begin to

situate emotional awareness as an important factor for subjective well-being and healthy aging process and have implications for interventions to promote healthy aging and diminish psychological distress across the lifespan.

## **CHAPTER 2: CLARITY OF EMOTIONS AND GOALS: EXPLORING ASSOCIATIONS WITH WELL-BEING ACROSS ADULTHOOD (STUDY ONE)**

Despite declines in cognitive and physical health associated with aging, the past several decades have shown that most older adults actually experience increases in emotional health (Carstensen et al., 2000; Charles & Carstensen, 2010). Carstensen (1992) proposed socioemotional selectivity theory, which posits that as people perceive time as more limited (e.g., approaching the end of life), motivation shifts toward emotionally meaningful goals. In line with this theory, negative affect declines with age (Carstensen et al., 2000), older adults report experiencing higher levels of cheerfulness and contentment than young adults (Berenbaum et al., 2013), and older adults report having more control of their emotions than young adults (Lawton et al., 1992). Although it has been proposed that these increases in emotional health are due to older adults engaging in better emotion regulation, research examining age differences in emotion regulation strategy use has found little difference between the type and number of strategies used by older and younger adults (Shiota & Levenson, 2009; Eldesouky & English, 2018). The present research, guided by both socioemotional selectivity theory and the Affect-as-Information approach (Clore et al., 2018), puts forth an alternative explanation for the increases in emotional health in older adulthood. Affect-as-Information is an approach to understanding the role of emotions in cognition which emphasizes the importance of emotions for providing information to people about their goals, internal states, relationships, and environment (Clore, Gasper, & Garvin, 2001; Gohm & Clore, 2002; Storbeck & Clore, 2008; Gohm, 2003). One possible explanation for why older adults are able to work toward emotionally meaningful goals is that they have better knowledge and understanding of the information provided by their emotions.

Emotional awareness refers to a set of metacognitive processes involving the monitoring, evaluation, and identification of one's direct emotional experiences (Gohm & Clore, 2000; Boden & Thompson, 2017; Eckland et al., 2021). While cognitive declines are a prominent feature of the aging process, metacognitive processes (i.e., the processes dealing with the monitoring, evaluating, and control of one's thoughts; Dunlosky & Metcalfe, 2009) tend to be spared from decline (Hertzog & Hultsch, 2000; Hertzog & Dunlosky, 2009). In fact, metacognitive monitoring interventions have been proposed as one way for teaching older adults to compensate for declines in more basic cognitive functions (Hertzog & Dunlosky, 2009). One facet of emotional awareness, emotional clarity, deals with how clearly people can identify and describe their emotions (Gohm & Clore, 2000). In line with metacognition being spared during the aging process, the present research tests the possibility that over the life course, the accumulation of emotional experiences may contribute to increased emotional clarity in older adulthood. In turn, increased emotional clarity in older adulthood may help explain the increased emotional well-being that older adults report.

### **Emotional Clarity**

Research on emotional clarity has unequivocally pointed to this ability being adaptive in several ways. Deficits in emotional clarity are associated with several forms of psychopathology including depression (Boden & Thompson, 2015; Eckland et al., 2021), worry (Eckland & Berenbaum, 2021), and alcohol use (Vine & Aldao, 2014). Higher levels of emotional clarity are associated with greater life satisfaction (Extremera & Fernandez-Berrocal, 2005), subjective well-being (Lischetzke et al., 2012), and vitality (Extremera & Fernandez-Berrocal, 2006). Emotional clarity is thought to be important for successful emotion regulation and coping (Boden & Thompson, 2015; Lischetzke & Eid, 2017; Eckland & Berenbaum, 2021) because

having a clearer understanding of one's emotions should facilitate more optimal strategy selection and implementation. Dizén, Berenbaum, and Kerns (2005) also found emotional clarity is associated with better understanding of one's psychological needs, suggesting people clearer in their emotions, may also have more clarity about their needs and goals. Having a clearer understanding of what one feels, what one needs, and what one's goals are should facilitate not only more successful emotion regulation, but also need satisfaction and goal attainment more generally, which are key components of a fulfilling life (Sheldon & Elliot, 1999; Freund, Hennecke, & Riediger, 2010).

It should be noted that emotional clarity typically refers to the type of emotion that one feels. However, Boden and Berenbaum (2011) distinguished two types of emotional clarity: emotional clarity of type (identifying the type of emotion one feels) and emotional clarity of source (identifying the causes of one's emotion). Few investigations have included both emotional clarity of type and source. Among studies that have included both, emotional clarity of type and source have shown divergent, but adaptive, patterns of association with emotion regulation strategies (Boden & Thompson, 2015) and different associations with depression (Boden & Thompson, 2015), day-to-day levels of worry (Eckland & Berenbaum, 2021), executive functioning (Eckland et al., 2021), and sociodemographic variables (Mankus et al., 2015). These two facets of emotional clarity also tend to be highly correlated, so it is likely that if emotional clarity of type increases with age, so will emotional clarity of source.

Models of aging and emotional well-being emphasize the strengths that older adults possess, including their accrued years of experience and knowledge (Charles, 2010). It is possible that emotional clarity may increase in older adulthood given the years of experience people would have experiencing their emotions. Importantly, changes in emotional clarity may

have implications for how people understand their goals, which may help to explain changes in well-being in older age. Based on the literature on emotional clarity in young and middle adulthood, we expect not only the highest levels of emotional clarity will be seen in older adulthood, but that emotional clarity will continue to be associated with positive psychological outcomes in older adulthood.

### **Goals, Goal Clarity, and Emotional Well-Being**

Goals are broadly defined as internal representations of desired states (Austin & Vancouver, 1996) and are intrinsically linked to emotions. Evolutionary perspectives on emotions suggest they have been naturally selected due to the various ways they can increase fitness in challenging situations (Nesse & Ellsworth, 2009). Functional accounts extend this point of view to suggest one of the functions emotions serve is providing information to people about their goals (Gross & Keltner, 1999). For example, contentment may signal one's goals and needs are satisfied, whereas frustration may signal one is being blocked from achieving their goals (Huntsinger & Clore, 2012). An important aspect of goals is they can be characterized, like emotions, along several dimensions, such as importance or difficulty (Austin & Vancouver, 1996). However, there is disagreement about what nomothetic dimensions fully capture the dimensions that describe goals. Goal clarity has been proposed as describing how clearly one understands their goals and what they need to do to accomplish them (Winell, 1986). However, this dimension has largely been ignored outside of organizational psychology, where researchers have been interested in the clarity with which people understand their role within an organization (Sawyer, 1992). Despite the lack of empirical research directly examining goal clarity, in theory, goal clarity should be vital for being able to prioritize how one invests and pursues their goals.

One approach to goals is the personal strivings approach proposed by Emmons (1986). This approach involves participants identifying characteristic goals that they strive to achieve through everyday behavior. Personal strivings can then be rated along several dimensions, such as clarity, value, ambivalence, and probability of success. This approach is advantageous because it is idiographic in nature, but includes nomothetic dimensions that allow for comparisons across people. In his original study on personal strivings and life satisfaction, Emmons (1986) found that goal clarity was positively associated with commitment to personal strivings and probability of success. Goal clarity also showed a small positive association with life satisfaction. Due to the large number of dimensions personal strivings were rated on, subsequent studies have often selected a smaller number of dimensions (Emmons & King, 1988; Sheldon & Elliot, 1999; Sheldon & Kasser, 2001) or combined across dimensions for parsimony (King et al., 2006). However, both of these approaches have disadvantages because information is lost about potentially important dimensions and reliability estimates across heterogeneous dimensions are often quite low. In line with the hypothesis that goal clarity should promote well-being, a recent model of socioemotional skills, developed from the Big Five personality traits, includes a goal regulation facet (measuring one's capacity to set clear goals, prioritize goals, and pursue goals despite difficulty) which was positively associated with life satisfaction (Soto et al., under review).

Socioemotional selectivity theory suggests narrowing perceptions of time lead to an increase in emotional well-being due to a shift in goals (Carstensen, 1992). Goals and emotional well-being are intrinsically linked in this theory. People who view time as more limited select goals based on how they will make them feel. For example, as opposed to spending time learning a new language, which may provide a sense of mastery, spending time with family, which



provides a sense of pleasure and fulfillment, is more likely to be prioritized. This theory suggests people must have some knowledge about their feelings and where they come from (i.e., emotional clarity of type and source) in order to select goals that will lead to those feelings. Additionally, having a clearer understanding of one's goals should be important for this change in how goals are prioritized. Thus, emotional and goal clarity seem to be important, potentially overlapping, traits underlying the shifts documented in socioemotional selectivity theory that promote emotional well-being. In order to understand the mechanisms of healthy emotional aging, the gaps in literature regarding emotional clarity, goal clarity, and aging need to be addressed.

### **The Present Research**

The present study used cross-sectional methods as an initial test of (1) the associations between emotional and goal clarity; (2) differences in levels of clarity across adulthood; and (3) the associations between these types of clarity and psychological well-being across adulthood. Regarding our first goal, we tested several models, including a single-factor, correlated factor models, and a bifactor model, to account for the structure of emotional and goal clarity. Regarding our second goal, we hypothesized that older adults would have the highest levels of psychological clarity (i.e., of both emotional and goal clarity). Finally, regarding our third goal, we hypothesized that emotional clarity and goal clarity would be positively associated with life satisfaction and negatively associated with depression. Given that a core aspect of depression is emotional disturbance (Clark & Watson, 1991) and life satisfaction is thought to be the cognitive dimension of subjective well-being (Diener, 1984), we hypothesized that emotional clarity would be more strongly linked to depression, whereas goal clarity would be more strongly linked to life satisfaction.

## Methods

### Participants

**Sample 1: Emerging Adults Sample.** This sample was collected using the undergraduate subject pool at a large midwestern university. Participants provided informed consent and received course credit for their participation. The final sample included 329 participants (67.8% female; 32.2% male; 0% non-binary) ranging in age from 18 to 25 ( $M_{AGE} = 19.3$ ;  $SD_{AGE} = 1.4$ ). Participants self-identified as: 41.6% White/European American, 31.9% Asian American; 8.2% Black/African American; 7.6% multiracial, .6% Native American, and 10.0% none of listed categories. In terms of ethnicity, 20.4% reported identifying as Latina/Latino or Latinx. The research was approved by an Institutional Review Board.

**Sample 2: Younger to Middle Adults Sample.** This sample was collected online in October 2020 using the online platform Prolific ([www.prolific.co](http://www.prolific.co)). Participants were eligible if they were over the age of 18, lived in the United States, and reported having English as a first language or being fluent in English. Data from 200 participants in three age stratified samples (50 participants between 25-35; 75 participants between 35-45; 75 participants between 45-55) were collected to ensure adequate coverage from young to middle adulthood. Usable data<sup>1</sup> was available for 185 participants (68.6% female; 75.1% White; 10.3% Black; 4.9% Asian; 6.5% multiracial; 3.2% reported a race other those previously listed; 8.1% Latino/Latina ethnicity), whose ages ranged from 25 to 55 (mean = 40.3 years old; SD = 9.0 years). The research was approved by an Institutional Review Board.

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<sup>1</sup> Data quality was assessed based on written responses in the personal strivings task (described below). Data were removed in Sample 1 if they reported fewer than six personal strivings and in Sample 2 if they reported fewer than five personal strivings due to low effort. Participants who did not actually list personal strivings (e.g., copy and pasting instructions) were removed for poor data quality.

**Sample 3: Middle to Older Adults Sample.** This sample was also collected online in October 2020 using the online platform Prolific ([www.prolific.co](http://www.prolific.co)). The same eligibility criteria were used as Sample 2. Data from 200 participants in four age stratified samples (60 participants between 55-60; 60 participants between 60-65; 50 participants between 65-70; 30 participants ages 70+) were collected to ensure adequate coverage ranging from midlife to older adulthood. Note that age 55 roughly corresponds to the youngest age that someone from the “Baby Boomer” generation would be in 2020 when the data were collected. Usable data (evaluated based on the same criteria as Sample 2) was available for 195 participants (60.5% female; 91.3% White; 3.1% Black; 2.6% Asian; 1.5% multiracial; 1.5% reported a race other those previously listed; 3.1% Latino/Latina ethnicity), whose ages ranged from 55 to 81 (mean = 63.7 years old; SD = 5.8 years). The research was approved by an Institutional Review Board.

## **Procedures**

Participants completed the measures in a pseudo-randomized order. All participants began by writing about their personal strivings (described below), then in a randomized order completed measures of emotional clarity, depression, and life satisfaction. Participants then completed a subset of three supplemental measures from a set of six possible supplemental measures (not used in the current study). Participants in the emerging adult sample completed all of the supplemental measures. Participants in Sample 1 took approximately 45 minutes to complete the study and were compensated with course credit. Participants in Samples 2 and 3 took approximately 25 minutes to complete the study and were compensated with \$3.50.

## **Measures**

**Emotional Clarity.** Emotional clarity of type was measured with 13 items identified through multidimensional scaling by Palmieri, Boden, and Berenbaum (2009). Eight of the items

come from the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995) emotional clarity subscale and five of the items come from Toronto Alexithymia (TAS; Bagby et al., 1994) difficulty identifying feelings subscale. Items were rated on a 5-point scale (1 = *Strongly disagree*, 5 = *Strongly agree*). An example item is, “I can’t make sense out of my feelings (TMMS; reverse-scored).” Internal consistencies were good for emerging adults ( $\omega_t = .92$ ,  $\alpha = .91$ ), young-to-middle adults ( $\omega_t = .95$ ,  $\alpha = .94$ ), and middle-to-older adults ( $\omega_t = .94$ ,  $\alpha = .93$ ). Emotional clarity of source was measured using the Sources of Emotions Scale developed by Boden and Berenbaum (2011). This scale has 8 items which are rated on a 5-point scale (1 = *Strongly disagree*, 5 = *Strongly agree*). An example item is, “I often have to think for a while to figure out what made me happy or excited.” Internal consistencies were good for emerging adults ( $\omega_t = .88$ ,  $\alpha = .84$ ), young-to-middle adults ( $\omega_t = .92$ ,  $\alpha = .89$ ), and middle-to-older adults ( $\omega_t = .92$ ,  $\alpha = .88$ ).

**Personal Strivings and Goal Clarity.** We measured clarity of goals using procedures originally developed by Emmons (1986) to assess dimensions of personal strivings. These procedures involve writing a list of eight personal strivings (e.g., “I want to be a healthy person,” “I want to avoid gossiping with others”). Each striving was rated using Emmons’ (1986) clarity item (“How clear of an idea do you have of what you need to do to be successful in this striving?”) on a 7-point scale (1 = *Extremely unclear*, 7 = *Extremely clear*). For the samples collected online, only six strivings were measured in order to reduce the overall time the survey took. For analyses involving the emerging adult sample, we used the first six out of the eight strivings listed, as strivings that were recorded first should have been most salient/accessible in the participant’s mind and should represent the most important goal to the participant (Higgins,

1996). Internal consistencies were good for emerging adults ( $\omega_t = .77$ ,  $\alpha = .62$ ), young-to-middle adults ( $\omega_t = .81$ ,  $\alpha = .75$ ), and middle-to-older adults ( $\omega_t = .83$ ,  $\alpha = .70$ ).

**Life Satisfaction.** We measured well-being using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). This five-item measure includes items such as, “In most ways my life is close to ideal.” Items are rated on a 7-point scale (1 = *Strongly Disagree*, 7 = *Strongly Agree*). Internal consistencies were good for emerging adults ( $\omega_t = .88$ ,  $\alpha = .85$ ), young-to-middle adults ( $\omega_t = .93$ ,  $\alpha = .92$ ), and middle-to-older adults ( $\omega_t = .92$ ,  $\alpha = .90$ ).

**Depression.** Depression was measured using the 8-item version of the Mood and Anxiety Symptoms Questionnaire (Watson et al., 1995). Example items include “Felt unattractive” and “Felt withdrawn from people.” Items are rated on a 5-point scale (1 = *Not at all*, 5 = *Extremely*) indicating how much the participant felt that way over the past week. The suicide item was not administered due to IRB concerns. Bredemeier et al. (2010) found that the 8-item version was superior to the full 22-item version for screening for current Major Depressive Disorder. Internal consistencies in the present sample were good for emerging adults ( $\omega_t = .90$ ,  $\alpha = .86$ ), young-to-middle adults ( $\omega_t = .93$ ,  $\alpha = .89$ ), and middle-to-older adults ( $\omega_t = .91$ ,  $\alpha = .86$ ).

### **Analytic Plan**

Analyses took place in three stages corresponding to the three study goals. Initially, we tested four models (see Figure SA2.1 in Supplemental Materials): a one-factor model where indicators for emotional and goal clarity loaded onto a single latent variable; a two correlated factors model where indicators for emotional clarity of type and source loaded onto one latent variable and goal clarity loaded onto another latent variable; a three correlated factors model where emotional clarity of type, source, and goal clarity indicators all loaded onto their own latent variables, which were allowed to correlate; and a bifactor model with a single general

clarity factor that all indicators loaded onto and then separate specific factors for emotional and goal clarity. As described in Supplemental Materials, the three-factor model appeared to be the best fitting model, but the latent emotional clarity of type and source variables were highly correlated to the point of redundancy. Since there is no theoretical reason to prioritize items intended to measure type versus source clarity, we conducted a CFA specifying one factor that all emotional clarity of type and source items were allowed to load onto. We used a conservative factor loading cutoff of .70 to decide which items to retain for subsequent analyses. Nine items (eight type and one source) remained. We refit three models: a one factor model, a two-factor model, and a bifactor model. Based on the results described below, we proceeded with the two-factor model for subsequent multigroup analyses.<sup>2</sup>

Next we used multigroup CFA to test measurement invariance across the emerging, young-to-middle, and middle-to-older adult groups. First, we added a mean structure to the model. Then we tested the model with increasing constraints: first configural invariance, then metric invariance, then scalar invariance, then strict invariance. Model fit was compared using several fit indices:  $\chi^2$  difference tests,  $\Delta\text{CFI} \leq .01$ ,  $\Delta\text{RMSEA} \leq .015$ ,  $\Delta\text{SRMR} \leq .030$  for the metric model, and  $\Delta\text{SRMR} \leq .015$  for scalar and strict invariance models (Chen, 2007; Beaujean, 2014; Putnick & Bornstein, 2016). Scalar invariance (i.e., intercepts constrained to be equal) is needed to test the hypothesis that the eldest group would show the highest levels of emotional and goal clarity (Bontempo & Hofer, 2007).

Finally, we tested associations between emotional and goal clarity and depression and life satisfaction. We then constructed an SEM with emotional and goal clarity predicting depression and life satisfaction. The outcomes were specified as correlated latent variables, with their scale

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<sup>2</sup> All analyses were also conducted using item parcels. Results did not change whether parcels or items were used as indicators. Analyses using parcels are presented in supplemental materials.

items as indicators. We tested this model using the same multigroup procedures described above. Metric invariance (i.e., factor loadings constrained to be equal) is needed to make comparisons across groups about covariances and path coefficients (Bontempo & Hofer, 2007).

All models used full information maximum likelihood estimation. In all models, model fit was evaluated using criteria from Hu and Bentler (1998): confirmatory fit index (CFI; greater than or equal to .90 is considered “good fit”), root mean square error of approximation (RMSEA; less than or equal to .06 is considered “good fit”), and standardized root mean square residual (SRMR; less than or equal to .08 is considered “good fit”). To evaluate bifactor models we calculated: (1) the explained common variance of the general factor (i.e., ECV; Rodriguez et al, 2016), or the percent of variance extracted from the indicators explained by the general factor--higher ECV signals that the indicators are measuring a unidimensional construct; (2) indicator-explained common variance (I-ECV; Stucky & Edelen, 2015), or the proportion of variance per indicator explained by the common factor; (3) omega hierarchical ( $\omega_H$ ) for common factor (McDonald, 1999), or the proportion of variance in total scores that is attributable to the general factor; (4) and omega hierarchical subscale ( $\omega_{HS}$ ) for each specific factor (Reise et al., 2013), or the reliability of the subscale score after controlling for variance due to the general factor .

## Results

Descriptive statistics and correlations among manifest variables are shown in Table 1. Since the emerging adult sample differed from the other samples in terms of racial make-up (in that this sample had relatively similar numbers of Asian/Asian American and White participants), we tested for differences in study variables across the two racial groups. Asian/Asian American and White participants did not differ in terms of type clarity,  $t(202.3) = .21, p = .83$ , source clarity,  $t(196.6) = -1.24, p = .22$ , goal clarity,  $t(203.4) = -.51, p = .61$ , or

depression,  $t(199.4) = 1.39, p = .17$ . However, White participants (mean = 4.5, SD = 1.2) reported higher levels of life satisfaction,  $t(205.7) = -3.13, p = .002, d = .4$ , relative to Asian/Asian American participants (mean = 4.0, SD = 1.4). Given there were no differences in levels of psychological clarity between Asian/Asian American and White participants, it is unlikely that any differences observed in levels of clarity across age groups would be due to the different racial make-up of the youngest group.

### **Goal 1: Testing the Structure of Emotional and Goal Clarity**

Results from CFAs testing the structure of emotional and goal clarity are shown in the top section of Table 2. The one-factor model had poor fit to the data. The two-factor model had good fit to the data across fit indices and suggested emotional and goal clarity factors were moderately correlated,  $r = .37, p < .001$ . The bifactor model also had good fit to the data. The general factor explained greater variance in the emotional clarity items (I-ECV range = [.33 - .92]), relative to the goal clarity ratings (I-ECV range = [.10 - .44]). The ECV of the general factor was .56. For the common factor,  $\omega_H = .71$ . For the emotional clarity factor,  $\omega_{HS} = .11$ , and for the goal clarity factor,  $\omega_{HS} = .17$ . All factor loadings are shown in Supplemental Table 1A. Given the emotional and goal clarity factors were only moderately correlated and the emotional and goal-specific factors in the bifactor model had very little reliable residual variance, we selected the well-fitting two-factor model for subsequent multigroup analyses.

### **Goal 2: Examining Differences in Levels of Clarity Across Adulthood**

We began by testing the measurement invariance of the two-factor model across age groups. Results are shown in the middle section of Table 2. Differences across fit indices suggested that the scalar model could be interpreted, which allows for mean differences in latent constructs to be examined.



Results from the scalar model are shown in Table 3. The young-to-middle adults showed increased levels of emotional clarity relative to the emerging adults,  $z = 3.17, p = .002$ . In line with our hypothesis, the middle-to-older adult group showed the highest levels of emotional clarity relative to other groups,  $z = 8.35, p < .001$ . The young-to-middle adults also showed increased levels of goal clarity relative to the emerging adults,  $z = 2.02, p = .04$ . The middle-to-older adult group also showed higher levels of goal clarity relative to emerging adults,  $z = 2.84, p = .004$ , but this was only slightly higher than the young-to-middle adult group. Taken together, we found strong evidence of age differences in emotional clarity, such that young adults experience the lowest levels of emotional clarity and older adults experience the highest levels. There also appears to be an increase in goal clarity associated with maturing from emerging adulthood into young adulthood, but this increase is less pronounced for older participants.<sup>3</sup>

### **Goal 3: Examining Associations with Psychological Well-Being**

Finally, we tested an SEM adding depression and life satisfaction as correlated outcomes to the two-factor emotional and goal clarity model. Again we began by testing measurement invariance (see bottom section of Table 2). Differences across fit indices suggested that the metric model could be interpreted, which allows for comparisons of covariances and regression coefficients. Table 4 shows the results of the metric model.

Among emerging adults, emotional clarity was associated with lower depression and higher life satisfaction. Goal clarity was not linked to depression in emerging adults, but was

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<sup>3</sup> We wanted to rule out the possibility that the differences we observed were due to methodological differences (i.e., data from emerging adults was collected in-person, whereas the two older samples were collected online). Therefore, we tested measurement invariance across the two online samples, the young-to-middle and middle-to-older adult groups. These tests again indicated the scalar model could be interpreted. Results replicated what was found comparing the three groups: (1) middle-to-older adults showed higher levels of emotional clarity relative to young-to-middle adults,  $z = 4.03, p < .001$ ; and (2) middle-to-older adults and young-to-middle adults did not significantly differ in levels of goal clarity,  $z = .58, p = .57$ .

positively associated with life satisfaction. Among young-to-middle adults, emotional clarity was associated with lower depression and to a weaker extent higher life satisfaction. Among young-to-middle adults, goal clarity was also associated with higher life satisfaction, and to a weaker extent lower depression. The middle-to-older adults showed the same pattern as the young-to-middle adults. It is noteworthy that in line with our hypotheses, emotional clarity was more strongly linked with depression than was goal clarity, whereas goal clarity was more strongly linked to life satisfaction than was emotional clarity.

### **Discussion**

In line with our hypothesis that emotional clarity increases with age, we found that levels of emotional clarity were lowest among young adults and highest among older adults. Our key findings also include emotional clarity and goal clarity being moderately associated but distinguishable traits. These traits are also both linked to levels of depression and life satisfaction across the adult lifespan. Our findings raise the possibility that interventions that increase emotional and goal awareness may be helpful for improving satisfaction with life and mitigating levels of depression across the lifespan.

Emotional clarity appeared to linearly increase across the age groups. Models of emotional aging, such as the strengths and vulnerabilities integration model (Charles, 2010) and socioemotional selectivity theory (Carstensen, 1992), have been used to make predictions about age-related emotion regulation changes. Contrary to these predictions, studies examining age-related differences in emotion regulation strategies find few, if any age differences, in the types of strategies, number of strategies, and successful use of different strategies (e.g., Shiota & Levenson, 2009; Opitz et al., 2014; English & Eldesouky, 2018; Benson et al., 2019; Growney & English, 2020). However, age differences have been observed in processes that may contribute to

emotion regulation. For example, older adults show greater attention to positive stimuli (Isaacowitz, 2012), engage in more problem-focused coping (Blanchard-Fields et al., 2004), and are less reactive to emotional stimuli (Luong & Charles, 2014). The results of the present study, along with the studies just mentioned, suggest that what changes with age is processes that support emotion regulation, such as emotional clarity, and not the types of strategies employed. Emotional clarity is important because to the extent emotions provide information (Clore et al., 2018) about one's environment, internal state, and goal progress, having a clear understanding of one's feelings should facilitate optimal use of that affective information for goal pursuit, emotion regulation, and coping.

In contrast to emotional clarity, goal clarity increased from the youngest to the middle group, but did not increase by a significant margin from the middle to the eldest group. These patterns suggest that young adults likely have the most difficulty setting clear attainable goals. Compared to the middle and eldest groups, goal clarity was a noticeably weaker predictor of both depression and life satisfaction (with an approximate difference of  $\beta = .10$ ). We expect that goal clarity is important because it helps one work more consciously towards their goals in everyday life. These findings may indicate that for young adults, who experience greater levels of neuroticism (Roberts & Mroczek, 2008) and neuroticism-motivated impulsivity (Whiteside & Lynam, 2001), having clear goals may be less important than more clearly understanding one's emotions. Greater emotional clarity is linked to less affective instability (Thompson et al., 2009) and less impulsivity (Coccaro et al., 2016). Therefore, in young adulthood, clearly understanding one's emotions may be more important than understanding goals. It may also be the case that in emerging adulthood, when goals are more transient, it is not as beneficial for the individual to be clear about them. Young adulthood is a period characterized by large increases in

conscientiousness (Roberts & Mroczek, 2008), which is composed of traits like self-control and perseverance that should facilitate goal attainment. Increasing stability of one's long term goals and increasing levels of conscientiousness may explain why goal clarity only increased from emerging adults to the young-to-middle adult group. Once someone has matured out of young adulthood, having clear goals appears to become more important for being able to live a satisfying life. Older adults, who had the highest levels of emotional clarity, may be best able to use their knowledge of their emotions to guide goal selection and pursuit. Being able to select clear goals based on knowledge of how attaining that goal will make one feel should have a greater positive impact on psychological well-being rather than investing oneself in goals that have unknown emotional impact.

Although the results of the present research suggest that emotional clarity increases across adulthood, we do not know why this is the case. One possibility is that over time people accumulate a larger number of emotional experiences. Although the greater number of emotional experiences one has accumulated may be driving this effect, there are other potential mechanisms that future research should explore. Another facet of emotional awareness, attention to emotions, may explain who tends to experience greater increases in emotional clarity with age. Paying attention to one's emotions and valuing them as a source of information may be building blocks for developing understanding of what one feels. Likewise, more general metacognitive ability may contribute to greater emotional clarity over time. Finally, individual differences in affect valuation, or the extent to which one values their emotional experiences (Tsai, 2007) or believes their emotions to be useful (Chow & Berenbaum, 2012), could contribute to greater clarity over time. To the extent one views emotions as valuable or useful, they may be more likely to make efforts to understand the emotions they feel and the causes of their emotions.

Having a better understanding of the mechanisms driving this change could inform how to better construct interventions such as socioemotional skills taught in schools or emotional awareness training conducted during psychotherapy.

### **Limitations and Future Directions**

Though the present results are cross-sectional, they provide initial evidence that there may be linear growth in levels of emotional clarity through adulthood. Though longitudinal studies will be needed to provide further evidence of within-person change over time, our ability to test this hypothesis is limited given the time (i.e., decades) and resources required to test it. Since the groups were compared cross-sectionally, it is possible that the results of the present study may be due to cohort effects between the generations of adults included. A cohort effect might actually predict an opposite pattern of results than we found. One major difference between the eldest and youngest groups is the way they may have been socialized about their emotions. Over the past several decades, emotion socialization has become more prioritized in youth across informal (e.g., home) and formal (i.e., school) settings (Durlak et al., 2011) and seen as a strength (e.g., emotional intelligence; Mayer et al., 2008) that should be fostered. The youngest generations would more likely have gotten positive socialization about their emotions, which could have resulted in greater emotional clarity. Since this was not the pattern we found, it seems less plausible that our results are due to cohort effects rather than developmental differences. In fact, the results of the present study could even suggest that experience has a greater impact on emotional clarity than emotion education.

Constructs in the present study were all measured using self-report. Though indirect measures of emotional clarity exist (e.g., using reaction times of self-reported emotions; Lischetzke et al., 2011), self-reports of emotional clarity are the most widely validated measures

available. In fact, our analyses suggest the self-report measure has strong measurement invariance across the adult lifespan, further supporting its use. Boden and Berenbaum (2011) proposed that self-reports of emotional awareness (i.e., attending to and understanding one's emotions) is most likely accessible through introspection given their meta-cognitive nature. Furthermore, emotional clarity and goal clarity were measured using a single instrument each, making it impossible to distinguish whether the factor structure observed in the present samples reflects the associations between the constructs themselves or the associations between the instruments used to measure the constructs. Future work should seek to replicate the two-factor structure using multiple and alternative measures of emotional and goal clarity.

Emotional and goal clarity may be especially relevant to people who are in a depressive episode since depression disrupts both emotion and motivation. Explicitly clinical samples could have been used to ensure representation of more severe depression. However, the anhedonic depression subscale of the MASQ captures wide variation in depressive symptoms and is sensitive to clinically significant levels of depression (Bredemeier et al., 2010). To make diagnoses of depression, individual clinical interviews are needed. The MASQ is a much more efficient way to screen for depression in large samples. Based on the suggested MASQ cut-off criterion, approximately 33.4% of the youngest, 29.7% of the middle, and 19.6% of the eldest groups reported levels of depression consistent with a major depressive episode. The levels of depression within the emerging adult group are consistent with the increasing severity of stress and mental illness experienced by undergraduates (Auerbach et al., 2018). Furthermore, the levels of depression in the middle and eldest groups are consistent with emerging data on the deleterious effects on mental health from the COVID-19 pandemic (Pierce et al., 2020). Clinical

samples may be useful in future work to test the effectiveness of interventions that increase emotional and/or goal clarity for reducing depression.

## **Conclusion**

Across three large samples, using the gold standard method of group comparison, we found evidence that emotional clarity increases with age from young to older adulthood. We also found that emotional clarity was moderately linked to goal clarity, both of which were associated with psychological well-being. In line with socioemotional selectivity theory and the affect-as-information approach, increases in emotional clarity may help to explain why older adults tend to experience greater emotional health. More work will be needed to understand how and why emotional clarity increases with age.

## TABLES

**Table 1.1**

*Descriptive Statistics and Correlations among Study One Variables by Sample*

Emerging Adults (n = 329)					
	Type Clarity	Source Clarity	Goal Clarity	Life Satisfaction	Depression
Type Clarity	--				
Source Clarity	.72	--			
Goal Clarity	.28	.22	--		
Life Satisfaction	.32	.24	.19	--	
Depression	-.41	-.33	-.17	-.54	--
Mean (SD)	3.5 (.7)	3.8 (.6)	5.6 (.8)	4.3 (1.3)	2.6 (.9)
Young-to-Middle Adults (n = 185)					
	Type Clarity	Source Clarity	Goal Clarity	Life Satisfaction	Depression
Type Clarity	--				
Source Clarity	.81	--			
Goal Clarity	.33	.27	--		
Life Satisfaction	.27	.08	.36	--	
Depression	-.52	-.36	-.34	-.52	--
Mean (SD)	3.8 (.8)	3.9 (.7)	5.9 (.9)	4.0 (1.6)	2.5 (1.0)
Middle-to-Older Adults (n = 194)					
	Type Clarity	Source Clarity	Goal Clarity	Life Satisfaction	Depression
Type Clarity	--				
Source Clarity	.76	--			
Goal Clarity	.21	.20	--		
Life Satisfaction	.25	.14	.34	--	
Depression	-.44	-.27	-.27	-.55	--
Mean (SD)	4.0 (.6)	4.2 (.6)	5.9 (.8)	4.1 (1.5)	2.1 (.9)

*Note.* Correlations at the manifest, not latent, level.



**Table 1.2***Fit Indices From Measurement Model Selection and Model Invariance Analyses*

	Structure of Emotional and Goal Clarity				
	$\chi^2$ (df)	<i>p</i>	CFI	RMSEA	SRMR
One-Factor	573.26 (90)	<.001	.881	.087	.080
Two-Factors	141.55 (89)	<.001	.987	.029	.030
Bifactor	106.45 (76)	.01	.993	.024	.021
	Measurement Invariance of Two-Factor Model				
	$\Delta\chi^2$ (df)	<i>p</i>	$\Delta$ CFI	$\Delta$ RMSEA	$\Delta$ SRMR
Configural $\rightarrow$ Metric	65.06 (26)	<.001	-.010	.005	.017
Metric $\rightarrow$ Scalar	57.13 (26)	<.001	-.008	.003	.003
Scalar $\rightarrow$ Strict	155.12 (30)	<.001	-.032	.013	.005
	Measurement Invariance of Model with Well-Being Outcomes				
	$\Delta\chi^2$ (df)	<i>p</i>	$\Delta$ CFI	$\Delta$ RMSEA	$\Delta$ SRMR
Configural $\rightarrow$ Metric	82.54 (46)	<.001	-.004	<.001	.007
Metric $\rightarrow$ Scalar	194.45 (46)	.03	-.017	.005	.003
Scalar $\rightarrow$ Strict	231.81 (54)	<.001	-.020	.005	.002

**Table 1.3***Multigroup Latent Means and Covariances Model of Emotional and Goal Clarity with Scalar**Invariance Constraints*

Latent Variables	Emerging Adults			Young-to-Middle Adults			Middle-to-Older Adults		
	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$
Emotional Clarity									
TC 1	.76	19.87	<.001	.89	19.87	<.001	.69	19.87	<.001
TC 2	.65	16.75	<.001	.76	16.75	<.001	.58	16.75	<.001
TC 3	.81	18.77	<.001	.95	18.77	<.001	.73	18.77	<.001
TC 4	.72	17.87	<.001	.84	17.87	<.001	.64	17.87	<.001
TC 7	.72	18.94	<.001	.84	18.94	<.001	.65	18.94	<.001
TC 8	.71	17.05	<.001	.83	17.05	<.001	.64	17.05	<.001
TC 12	.69	18.00	<.001	.81	18.00	<.001	.62	18.00	<.001
TC 13	.77	19.96	<.001	.90	19.96	<.001	.69	19.96	<.001
SC 6	.68	17.00	<.001	.80	17.00	<.001	.61	17.00	<.001
Goal Clarity									
GC 1	.33	7.91	<.001	.43	7.91	<.001	.38	7.91	<.001
GC 2	.48	10.04	<.001	.62	10.04	<.001	.55	10.04	<.001
GC 3	.61	10.90	<.001	.78	10.90	<.001	.70	10.90	<.001
GC 4	.76	11.92	<.001	.98	11.92	<.001	.88	11.92	<.001
GC 5	.76	11.37	<.001	.98	11.37	<.001	.88	11.37	<.001
GC 6	.77	11.19	<.001	.99	11.19	<.001	.88	11.19	<.001
Covariances									
$r(\text{EC, GC})$	.38	5.89	<.001	.39	4.01	<.001	.26	2.83	.005
Intercepts									
	Mean	$z$	Var	Mean	$z$	Var	Mean	$z$	Var
Emotional Clarity	0	--	1	.29	3.17**	1	.89	8.35***	1
Goal Clarity	0	--	1	.20	2.02*	1	.30	2.84**	1

*Note.* TC = Emotional Clarity of Type Item; SC = Emotional Clarity of Source Item; EC =

Emotional Clarity; GC = Goal Clarity; \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

**Table 1.4***Multigroup Latent Means and Covariances Model of Emotional and Goal Clarity Predicting**Psychological Well-Being with Metric Invariance Constraints*

	Emerging Adults			Young-to-Middle Adults			Middle-to-Older Adults		
	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$
<b>Latent Variables</b>									
<b>Emotional Clarity</b>									
TC 1	.77	19.62	<.001	.90	19.62	<.001	.69	19.62	<.001
TC 2	.65	16.40	<.001	.76	16.40	<.001	.59	16.40	<.001
TC 3	.80	18.27	<.001	.94	18.27	<.001	.72	18.27	<.001
TC 4	.74	17.93	<.001	.87	17.93	<.001	.67	17.93	<.001
TC 7	.72	18.62	<.001	.85	18.62	<.001	.65	18.62	<.001
TC 8	.69	16.44	<.001	.81	16.44	<.001	.62	16.44	<.001
TC 12	.70	17.72	<.001	.82	17.72	<.001	.63	17.72	<.001
TC 13	.75	19.51	<.001	.88	19.51	<.001	.68	19.51	<.001
SC 6	.68	16.63	<.001	.80	16.63	<.001	.62	16.63	<.001
<b>Goal Clarity</b>									
GC 1	.34	7.96	<.001	.44	7.96	<.001	.39	7.96	<.001
GC 2	.49	10.27	<.001	.64	10.27	<.001	.57	10.27	<.001
GC 3	.59	10.67	<.001	.77	10.67	<.001	.68	10.67	<.001
GC 4	.77	11.98	<.001	1.00	11.98	<.001	.89	11.98	<.001
GC 5	.74	11.15	<.001	.97	11.15	<.001	.86	11.15	<.001
GC 6	.75	11.05	<.001	.98	11.05	<.001	.87	11.05	<.001
<b>Life Satisfaction</b>									
LS 1	1.39	19.66	<.001	1.84	19.66	<.001	1.68	19.66	<.001
LS 2	1.15	18.47	<.001	1.53	18.47	<.001	1.40	18.47	<.001
LS 3	1.34	19.71	<.001	1.77	19.71	<.001	1.62	19.71	<.001
LS 4	1.07	17.37	<.001	1.42	17.37	<.001	1.30	17.37	<.001
LS 5	1.00	14.46	<.001	1.32	14.46	<.001	1.21	14.46	<.001
<b>Depression</b>									
D1	.95	18.93	<.001	1.11	18.93	<.001	.93	18.93	<.001
D2	.71	14.29	<.001	.83	14.29	<.001	.70	14.29	<.001
D3	.82	16.65	<.001	.95	16.65	<.001	.79	16.65	<.001
D4	.84	16.46	<.001	.97	16.46	<.001	.82	16.46	<.001
D5	.91	16.75	<.001	1.05	16.75	<.001	.88	16.75	<.001
D6	.67	14.90	<.001	.77	14.90	<.001	.65	14.90	<.001
D7	.84	15.99	<.001	.97	15.99	<.001	.81	15.99	<.001
<b>Covariances</b>									
	$r$	$z$	$p$	$r$	$z$	$p$	$r$	$z$	$p$
$r(\text{EC, GC})$	.38	5.92	<.001	.39	4.03	<.001	.26	2.84	.005
$r(\text{LS, Dep})$	-.58	-12.15	<.001	-.50	-4.89	<.001	-.56	-5.35	<.001
<b>Regressions</b>									
	$\beta$	$z$	$p$	$\beta$	$z$	$p$	$\beta$	$z$	$p$
$\text{EC} \rightarrow \text{LS}$	.28	4.10	<.001	.15	1.89	.06	.20	2.59	.01

**Table 1.4 (cont.)**

EC → Dep	-.43	-6.05	<.001	-.46	-5.62	<.001	-.41	-5.05	<.001
GC → LS	.18	2.18	.03	.37	3.92	<.001	.34	3.66	<.001
GC → Dep	-.07	-.93	.35	-.22	-2.53	.01	-.22	-2.52	.01

*Note.* TC = Emotional Clarity of Type Item; SC = Emotional Clarity of Source Item; EC =

Emotional Clarity; EC = Emotional Clarity; GC = Goal Clarity; LS = Life Satisfaction; Dep =

Depression.

## **CHAPTER 3: DO MEAN-LEVELS OF NEGATIVE AND POSITIVE AFFECT TELL US EVERYTHING WE NEED TO KNOW? THE ROLE OF EMOTION**

### **DIFFERENTIATION IN PSYCHOLOGICAL WELL-BEING (STUDY TWO)**

Two of the most robust predictors of psychological well-being are experiencing low negative affect (NA) and high positive affect (PA) (Bradburn, 1969; Diener, 1984; Diener et al., 1999; Schimmack, 2006). Watson and Clarke (1991) argue that low PA and high NA are core components of depression. In fact, they argue that low PA is a central feature of depression that distinguishes it from anxiety. NA and PA have also long been considered the affective dimensions of subjective well-being (Diener, 1984; Diener et al., 1999). These dimensions are distinct from, but complement, the cognitive dimension of subjective well-being, life satisfaction (Diener, 1984), which is a global judgment about the quality of one's life (Schimmack, 2006). Importantly, in the cases of both depression and life satisfaction, NA and PA are typically referring to mean-levels of NA and PA (i.e., the average amount of NA or PA experienced over a given period of time).

While there is no doubt that the average levels of NA and PA a person experiences are important, the subjective experience of emotion is only one aspect of people's emotional lives that contributes to well-being. Factors outside of the direct experience of NA and PA, such as affective dynamics (i.e., the patterns of emotions over time) and meta-cognition about affective processes (e.g., one's awareness and evaluations of their emotions) have both been linked to aspects of psychological well-being (Trull et al., 2015; Houben et al., 2015; Boden & Thompson, 2015; Eckland & Berenbaum, 2021). Emotion differentiation, or the extent to which a person distinguishes among their pleasant or unpleasant emotional states (Barrett et al., 2001), is one aspect of people's emotional lives, outside their subjective experience, which is thought to be

important for psychological well-being (Kashdan et al., 2015). Among people lower in negative emotion differentiation (NED), emotions such as fear, sadness, or anger may be experienced or described similarly as “bad,” whereas for people higher in NED they are experienced more distinctly. Likewise, among people lower in positive emotion differentiation (PED), emotions such as amusement, cheer, or contentment may be experienced or described similarly as “good,” whereas for others higher in PED they are experienced as distinct from each other.

Emotion differentiation is thought to be one facet of emotional awareness (Mankus et al., 2015) that taps the specificity of one’s mental representations of their emotions at (or over) a given time frame (Erbas et al., 2021). According to the affect-as-information approach (Clore et al., 2001), emotions provide key information to a person about their environment, goals, and internal states (Gohm & Clore, 2002a; Clore et al., 2018). Therefore, attending to this information, clearly understanding it, and being able to distinguish among different forms of affective information should promote successful emotion regulation, coping, and ultimately well-being. Theories of emotion differentiation emphasize that specific emotions may necessitate different approaches to emotion regulation (Barrett et al., 2001; Kashdan et al., 2015). For example, frustration with an ongoing project, like writing a dissertation, may be dealt with by focusing on exciting aspects of the project, like the progress one has made. In contrast, anger with a coworker may not be reduced in the moment by focusing on that person’s positive qualities, but instead may be helped by removing oneself from the situation. As such, emotion differentiation has been proposed as an important process for understanding psychopathology and well-being (Kashdan et al., 2015).

A body of research (reviewed by Smidt & Suvak, 2015) has emerged linking emotion differentiation, especially of negative emotions, to various forms of psychopathology, including

depression (Demiralp et al., 2012; Erbas et al., 2014), borderline personality disorder (Zaki et al., 2013), and social anxiety (Kashdan & Farmer, 2014). By and large, this work has examined bivariate associations between individual differences in emotion differentiation and psychopathology outcomes. However, newer work (Dejonckheere et al., 2019) suggests that emotion differentiation, as well as other complex affective measures derived from emotion time series data, do not improve prediction of psychological well-being variables, such as depression or life satisfaction, over and above mean-level NA and PA. While this could be interpreted as evidence that emotion differentiation is not important for well-being, it should not be assumed that emotion differentiation has the same importance for well-being in all situations. The affect-as-information approach emphasizes that while a person may be continually making appraisals about their environment with (and without) awareness, emotions become elicited when something significant is detected (Gohm & Clore, 2002b). Therefore, in the context of more salient affect, such as very high or very low levels of NA or PA, emotion differentiation may be more important for mitigating depression or promoting life satisfaction.

Though Dejonckheere and colleagues (2019) show the associations between emotion differentiation and psychological well-being are likely explaining variance that is actually explained by mean-level NA and PA, there is evidence that in some contexts emotion differentiation may have increased relevance to psychological well-being. A number of studies have found that low emotion differentiation strengthens the link between rumination and psychopathology outcomes. Both Starr, Herschenberg, Li, and Shaw (2017) and Liu, Gilbert, and Thompson (2020) found that emotion differentiation moderated the associations between rumination and depression. Starr and colleagues (2017) found that low NED strengthened the relationships between rumination and depression in daily life. Liu and colleagues (2020) showed

that among people lower in emotion differentiation, but not among people higher in emotion differentiation, rumination prospectively predicted levels of depression six months later. Of note, Liu and colleagues (2020) demonstrated this effect while controlling for mean-level affect. Zaki and colleagues (2013) also showed that low emotion differentiation enhanced the relationship between rumination and non-suicidal self-injury in people with borderline personality disorder. Even though high emotion differentiation typically appears helpful, this is not always the case. Erbas and colleagues (2019) found that people who made greater distinctions within emotion categories (e.g., distinguishing between feeling sad, down, and blue), actually reported greater levels of depression. Therefore, to the extent that emotion differentiation may be important for psychological well-being, it must be considered in the context of the greater landscape of a person's emotional life.

In the present study, we sought to examine for whom, if anyone, emotion differentiation would contribute to psychological well-being. To this end, we examined whether NED and PED predicted depression and life satisfaction over and above mean levels of NA and PA. We further explored whether emotion differentiation moderated the known associations between NA, PA, and psychological well-being. Following the most common approach taken in the literature (e.g., Boden et al., 2013; Erbas et al., 2014; Erbas et al., 2019; Liu et al., 2020), we measured emotion differentiation using an intraclass correlation (ICC) derived from repeated measures of emotion data collected through intensive longitudinal studies (e.g., daily dairies), longitudinal studies, and lab-based tasks. Since emotion differentiation requires measuring emotions repeatedly, typically over a period of time, we wanted to examine whether the amount of time over which measurements are taken influences the links between differentiation and well-being. Therefore, we included four samples that varied in the amount of time between when repeated measures of



affect were taken. To be more certain that results were not due to the variability in time, methods, or sample idiosyncrasies, we made sure to replicate analyses in at least three samples. Finally, we weighted samples together to get more accurate estimates of effect sizes. Data were drawn from the Midlife in the United States (MIDUS) study, the Longitudinal Internet Studies for the Social Sciences (LISS), the Health and Retirement Study (HRS), and our own original data collected online (total  $N = 10,218$ ). Each sample included adults ranging from emerging adulthood to older adulthood (range across samples = 18 - 93). Each sample also included a range of emotions and varied in the timescale in which emotion differentiation was calculated: in the MIDUS sample, participants reported on daily emotions each day for 8 days; in the LISS sample, participants reported state levels of emotions, 11 times, each one year apart; in the HRS sample, participants reported on their emotions over the past month, three times, each four years apart; and in our original data, participants completed an online task measuring emotion differentiation.

Given the range of ages in each sample, from young adults to older adults, another goal of the current study was to test the associations between age and emotion differentiation. Socioemotional selectivity theory (Carstensen, 1992) suggests that as endings in time become more salient, people shift their goals to become emotionally meaningful. Greater emotion differentiation is thought to (1) reflect greater awareness of one's emotions (e.g., Kashdan et al., 2015; Erbas et al., 2014); and (2) direct emotion regulation with greater specificity (Barrett et al., 2001; Tugade et al., 2004). Furthermore, dynamic integration theory (Labouvie-Vief & González, 2004) suggests the capacity for cognitive-affective complexity and affective differentiation increases with age until cognitive resources become too taxed (e.g., when older adults experience the onset of cognitive decline). Therefore, with greater age, people may

represent their emotional experiences with greater specificity, which would allow older adults to select goals that will have greater emotional impact. Several studies (though largely limited by small samples) provide support for this hypothesis. Ready et al. (2019) found older adults ( $n = 27$ ) rated negative emotion terms as less similar compared to young adults ( $n = 56$ ). Ready and colleagues (2008) also found older adults ( $n = 28$ ) reported higher emotion differentiation compared to young adults ( $n = 21$ ). Ong and Bergeman (2004) found a modest correlation between age and emotion differentiation (assessed through within person factor analysis, not ICC) in a sample of older adults (ages 60 – 85;  $n = 40$ ). However, using the same method to calculate differentiation as Ong and Bergeman (2004), Hay and Diehl (2011) found older adults ( $n = 77$ ) reported lower differentiation compared to young adults ( $n = 81$ ). Thus, to conduct a large-scale test, we examined the associations between age and emotion differentiation in each sample (total  $N = 10,218$ ) and computed weighted average correlations.

## **Methods**

### **Participants and Procedures**

**Midlife in the United States (MIDUS) Wave 2 Daily Dairy Study.** This sample came from the daily diary study conducted during wave 2 of the MIDUS study. In total, 2,022 people participated in the daily dairy study. However, depression was measured as a part of the larger MIDUS Wave 2 project and was not available for all participants in the daily diary study. Thus, the final sample consisted of 1,842 participants (56% female; 92.1% White; 3.2% Black; 1.4% Native American; .5% Asian; 2.3% reported a race other those previously listed; 12% Latino/Latina ethnicity), whose ages ranged from 33 to 84 (mean = 56.5 years old;  $SD = 12.2$  years). Participants responded to 92.2% of daily surveys.

**Longitudinal Internet Studies for Social Sciences (LISS).** This sample was drawn from 11 available waves of the LISS study of Dutch adults. In total 13,890 people partially responded to at least one wave of LISS personality questionnaires (i.e., the survey containing the measures relevant to this study). Waves of data were collected one year apart. We wanted to maximize the number of affect items used to calculate NED and PED. The highest number of waves completed by any LISS participant was eight waves. We restricted the sample to participants who had completed the affect measure in at least six waves (i.e., just over half the sampling periods). Thus, the final sample consisted of 2,950 participants (51.6% female; 88.5% reported Dutch background; 3% reported first generation foreign Western background; 3.3% reported first generation foreign non-Western background; 5.2% reported second generation foreign background), whose ages ranged from 18 to 90 (mean = 53.4 years old; SD = 14.9 years).

**Health and Retirement Study (HRS).** This sample was drawn from the 2008, 2012, and 2016 waves of the HRS. These waves were chosen because they used the same measures of NA and PA from wave to wave. In total, 11,072 people partially responded to at least one wave of questionnaires. Because we wanted to maximize the number of affect items used to calculate NED and PED, we restricted the sample to participants who had complete affect data for all three waves. Thus, the final sample consisted of 5,047 participants (59.5% female; 84.8% White; 10.4% Black; 4.8% indicated a race other than White or Black; 7% Latino/Latina ethnicity), whose ages ranged from 28 to 93 (mean = 64.6 years old; SD = 9.1 years).

**University of Illinois at Urbana-Champaign-Affect Study (UIUC-AS).** Finally, emotion differentiation can also be calculated using scenario-based tasks where participants respond with how they would feel in a variety of pleasant and unpleasant situations (e.g., Boden et al., 2013; Erbas et al., 2014). Since we used samples measuring differentiation across three

timescales (daily, annually, and quadrennially), we also wanted to include a sample where differentiation was measured using a scenario-based task. This sample was collected in October 2020 using the online platform Prolific ([www.prolific.co](http://www.prolific.co)) as a part of a larger project examining facets of emotional awareness across the lifespan. Participants were eligible if they were over the age of 18, lived in the United States, and reported having English as a first language or being fluent in English. Data from 400 participants in seven age stratified samples (50 participants between 25-35; 75 participants between 35-45; 75 participants between 45-55; 60 participants between 55-60; 60 participants between 60-65; 50 participants between 65-70; 30 participants ages 70+) was collected to ensure adequate coverage across adulthood. The sampling strategy was planned so data would be available for approximately 200 participants under and over the age of 55. Usable data was available for 379 participants (64.6% female; 85.4% White; 6.7% Black; 3.8% Asian; 4.1% reported a race other those previously listed; 5.5% Latino/Latina ethnicity), whose ages ranged from 25 to 81 (mean = 52.3 years old; SD = 13.9 years).

All participants completed the measures of depression, life satisfaction, and the emotion differentiation task (all described below). These were presented to all participants in a pseudo-randomized order. Approximately half the participants completed the measure of mean-level NA and PA (all participants completed a random subset of half of the supplemental measures, among which were the mean-level NA and PA measures).

## **Measures**

**Depression.** Measures of depression were available in the MIDUS, HRS, and UIUC-AS samples. In the MIDUS and HRS samples, depression was measured using the Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al., 1998). Participants were asked two screening questions about depressed mood and anhedonia for a two-week period over

the past year. Participants who endorsed either of those symptoms in the past year were asked follow-up questions about the remaining symptoms of Major Depressive Disorder. Endorsed symptoms were summed, creating a scale of 0 (no symptoms endorsed) to 8 (all symptoms endorsed). The UIUC-AS sample used the 8-item version of the Mood and Anxiety Symptoms Questionnaire (MASQ; Watson et al., 1995). An example item is, “Felt withdrawn from people.” The suicide item was not administered due to IRB concerns. Items were rated on a 5-point scale (1 = *Not at all*, 5 = *Extremely*) indicating how much the participant felt that way over the past week. Bredemeier et al. (2010) found that the 8-item version was superior to the full 22-item version for screening for current Major Depressive Disorder. Internal consistencies in the present sample were excellent ( $\alpha = .88$ ,  $\omega_t = .91$ ).

**Life Satisfaction.** Measures of life satisfaction were available in the LISS, HRS, and UIUC-AS samples. In each sample, life satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). This five-item measure includes items such as, “In most ways my life is close to ideal.” Participants rate their agreement with items using a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*). For the LISS sample, the average internal consistencies across the 11 waves were good ( $\alpha = .89$ ,  $\omega_t = .92$ ). For the HRS sample, the average internal consistencies across the three waves were good ( $\alpha = .90$ ,  $\omega_t = .92$ ). For the UIUC-AS sample, the internal consistencies were good ( $\alpha = .91$ ,  $\omega_t = .93$ ).

**Measures of Positive and Negative Affect.** Below we describe measures of positive and negative affect in each sample.

**MIDUS.** To calculate mean-level affect and differentiation, we excluded items based on several criteria: (1) items that referred to relatively undifferentiated affective states (e.g., distressed; upset); (2) were synonymous with an item that was already included (e.g., scared is

synonymous with afraid)<sup>4</sup>; (3) were not clearly valenced (e.g., active, alert); (4) or referred to an affective, but not explicitly emotional state (e.g., jittery, attentive).<sup>5</sup> Because differentiation was calculated based on emotion ratings during the week of daily dairies, we calculated mean-level NA and PA based on the same daily ratings rather than using the PANAS administered at baseline. For NA, we used seven items (nervous, lonely, afraid, irritable, ashamed, angry, frustrated) and for PA, we used six items (cheerful, calm, satisfied, enthusiastic, proud, confident). Items were rated on a 5-point scale (0 = *None of the time*, 4 = *All of the time*) corresponding to how much the individual felt the emotion that day. We recoded items to be on a 1 to 5 scale to be consistent with the other samples that used a 5-point scale (i.e., the HRS and UIUC-AS samples). Between and within person reliabilities were acceptable (For NA,  $\omega_{\text{within}} = .68$ ,  $\omega_{\text{between}} = .91$ ; For PA,  $\omega_{\text{within}} = .75$ ;  $\omega_{\text{between}} = .95$ ).

**LISS.** NA and PA were measured in the LISS using the 20-item version of the PANAS (Watson, Clark, & Tellegen, 1988). We used similar criteria to reduce the items as Study 1, resulting in 6 items for NA (afraid, nervous, ashamed, irritable, hostile, guilty) and 6 items for PA (interested, determined, proud, enthusiastic, strong, excited). Items were rated on a 7-point scale (1 = *Not at all*, 7 = *Very much*) corresponding to how much the individual was presently feeling that emotion. Average internal consistencies for the 6-item NA and PA scales were good (NA  $\alpha = .89$ ,  $\omega_t = .92$ ; PA  $\alpha = .78$ ,  $\omega_t = .85$ ).

**HRS.** NA and PA were measured in the HRS using the 25 items drawn from the PANAS-X (Watson & Clark, 1994) and studies of emotions and aging (e.g., Carstensen et al., 2000).

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<sup>4</sup> Because we were interested in between category emotion differentiation (i.e., the form of ED most often studied; Erbas et al., 2019), we removed emotions of the same type so that estimates would not be biased by the extent to which someone differentiates within emotion categories.

<sup>5</sup> We also conducted analyses including all affect items in the calculation of mean-levels reported in Supplemental Materials. None of the conclusions of the study change based on which mean-level measure was used.

Based on our item-exclusion criteria, our scale resulted in eight items for NA (afraid, guilty, frustrated, bored, hostile, ashamed, nervous, sad) and eight items for PA (enthusiastic, proud, interested, happy, content, hopeful, calm, excited). Items were rated on a 5-point scale (1 = *Very much*, 5 = *Not at all*) corresponding to how much the individual felt that emotion in the past 30 days. We reverse coded items so higher values indicated experiencing the emotion more often. Average internal consistencies for the 8-item NA and PA scales were excellent (NA  $\alpha = .82$ ,  $\omega_t = .85$ ; PA  $\alpha = .90$ ,  $\omega_t = .92$ ).

**UIUC-AS.** For mean-level affect, five NA (sad, angry, anxious, ashamed/guilty, bored) and five PA (calm, contented/satisfied, cheerful, proud, excited) items were drawn from the affective circumplex (e.g., Larsen & Diener, 1992) to represent a range of emotional experiences across levels of valence and arousal. Participants indicated how much they felt in general by rating each item on a 5-point scale (1 = *Not at all*, 5 = *A great deal*). Internal consistencies for the NA and PA scales were good (NA  $\alpha = .79$ ,  $\omega_t = .82$ ; PA  $\alpha = .89$ ,  $\omega_t = .92$ ).

To measure emotion differentiation, participants were presented with five unpleasant and five pleasant scenarios that are commonly experienced and asked to recall the last time they were in that situation. Example unpleasant scenarios included “the last time you said something you wish you hadn’t said” and “the last time you had trouble with an electronic device.” Example pleasant scenarios included “the last time you ate your favorite meal” and “the last time you learned something new.” The full list of scenarios is available in Supplemental Materials. Scenarios were presented in a randomized order. Participants then rated how they felt during the unpleasant situations using seven NA items (angry, sad, anxious, ashamed, embarrassed, guilty, frustrated) and how they felt during the pleasant situations using seven PA items (cheerful, calm,

proud, content, enthusiastic, excited, interested) on a 7-point scale (1 = *Not at all*, 7 = *Extremely*).

### **Calculation of Emotion Differentiation**

We calculated emotion differentiation following Tugade and colleagues (2004), using the average intraclass correlations (ICC) with absolute agreement (Shrout & Fleiss, 1979) for all NA and PA items, respectively. Lower ICCs represent higher emotion differentiation. Therefore, for easier interpretation (higher scores = higher emotion differentiation), we subtracted raw ICC values by 1. Following established practices (e.g., Kalokerinos et al., 2019), we also Fisher Z transformed the raw ICC values and multiplied this index by -1 (again for easier interpretation, i.e., higher scores = higher emotion differentiation). We used the 1-ICC value for correlation analyses and the -1\*Fisher Z transformed ICC in regression analyses.

### **Analytic Plan**

We examined bivariate associations between emotion differentiation, mean-level affect, depression, life satisfaction, and age. Correlational analyses were followed by hierarchical multiple regression analyses using emotion differentiation and mean-level affect at step 1 and adding their interaction at step 2 to predict depression and life satisfaction. We examined negative and positive emotions separately. Interaction effects were decomposed using simple slopes analyses at low (-1 SD), average (mean), and high (+1 SD) levels of emotion differentiation (Aiken & West, 1991).

## **Results**

Descriptive statistics for study variables in each sample are provided in Table 2.1.



## **Bivariate Associations**

Table 2.2 shows zero-order correlations between NED, mean-level NA, depression, life satisfaction, and age. The correlations between NED and well-being variables were quite weak across samples. In contrast, and in line with expectations, mean-level NA showed moderate to strong correlations with depression and life satisfaction across samples. Age showed negligible to very small associations with NED, but was weakly negatively associated with mean-level NA.

Table 2.3 shows zero-order correlations between PED, mean-level PA, depression, life satisfaction, and age. PED and PA followed a similar pattern to NED and NA. PED was very weakly associated with depression, life satisfaction, and age across samples. PA showed weak to strong associations with depression and life satisfaction. The correlations between PA and age ranged from negligible to small.

Given the variability in sample sizes and correlation magnitudes, we calculated weighted average correlations, which are presented in Table 2.4. These correlations suggest that greater emotion differentiation (of both pleasant and unpleasant emotions) is very weakly associated with less depression, greater life satisfaction, and higher age. In contrast, the associations between mean-level affect and well-being variables (i.e., depression and life satisfaction) were much stronger. Age was weakly associated with lower NA and very weakly associated with greater PA.

## **Moderation Analyses**

Table 2.5 shows the results from hierarchical regression models using NA and NED. There was no evidence of NED moderating the relation between NA and depression. In contrast, the interaction between NA and NED significantly predicted life satisfaction in two out of the three samples, with all three samples showing the same pattern of coefficients. Figure 2.1 shows

results from simple slopes analyses conducted in each sample. The nature of the interactions was consistent across samples. As levels of NED increase, the negative association between life satisfaction and mean-level NA becomes stronger. As can be seen in Figure 2.1, among individuals with high levels of NA, it is those individuals with high NED who have especially low levels of life satisfaction.

Table 2.6 shows that there was a significant interaction between PA and PED in predicting depression in two out of three samples. It should be noted that the third sample showed the same patterns of coefficients, but the p-value for the interaction did not reach threshold for statistical significance. Figure 2.2 shows results from simple slopes analyses, which were conducted in each sample. Across all three samples, the link between mean levels of PA and depression was strongest among those with low levels of PED, and weakest among those with high levels of PED. As can be seen in Figure 2.2, among individuals with low levels of PA, it is those individuals with low PED who have especially high levels of depression.

The interaction between PA and PED in predicting life satisfaction was significant in one sample, just above the threshold for significance in one sample, and non-significant in the third. However, as was the case in the preceding analyses, the three samples showed roughly the same pattern of coefficients. We plotted these simple slopes for each sample in Figure 2.3. Across all three samples, the link between mean levels of PA and life satisfaction was strongest among those with high levels of PED, and weakest among those with high levels of PED. As can be seen in Figure 2.3, among those with low levels of PA, it was those individuals with high levels of PED who had especially low levels of life satisfaction. Conversely, among those with high levels of PA, it was those individuals with high levels of PED who had especially high levels of life satisfaction. Put another way, high levels of PED appear to magnify the life satisfaction

benefits of high mean levels of PA, but also magnify the life satisfaction detriments of low levels of PA.

### **Discussion**

In line with Dejonckheere and colleagues (2019), we found the bivariate associations between PED, NED, and psychological well-being were quite weak. Whereas across samples, mean-level NA and PA were moderately associated with depression and life satisfaction, the magnitude of the bivariate associations between PED, NED, and psychological well-being did not exceed  $|r| = .10$ . However, in line with theory on emotion differentiation and building upon previous work (e.g., Starr et al., 2017; Liu et al., 2019), we found consistent patterns of moderation. NED moderated the associations between NA and life satisfaction and PED moderated the associations between both PA and depression and PA and life satisfaction. Overall, our findings suggest that examining emotion differentiation within the larger context of a person's experiences of NA and PA helps to clarify when it is (and is not) associated with psychological well-being.

Our analyses of weighted average correlations across samples indicated that higher NED was associated to a very weak degree with depression. Though a link between NED and depression has emerged in previous work (e.g., Demiralp et al., 2012; Erbas et al., 2014), we did not observe this link in either the bivariate or moderation analyses. It should be noted that Demiralp and colleagues (2012) found this association when comparing participants with Major Depressive Disorder to healthy control participants; therefore a difference in NED may be more pronounced when comparing clinical samples to healthy controls due to the stark contrast in functioning between the samples. O'Toole and colleagues (2020) recently meta-analyzed the association between emotion differentiation and behavioral indicators of adaption (e.g., emotion

regulation success, urges to self-harm) and found the effect sizes were likely weaker than initially thought. The weak bivariate association between NED and depression is in line with O'Toole and colleagues' (2020) findings regarding specific adaptive behaviors, as well as a handful of studies failing to find strong associations between NED and psychopathology directly (e.g., Erbas et al., 2019; Eckland et al., under review).

Moderation analyses suggested at higher levels of NA, NED may actually be detrimental to one's life satisfaction. There may be some people for whom ignorance about one's unpleasant feelings is bliss. Among people who experience high levels of NA, making fine-grained distinctions among the various unpleasant feelings they are having (more often and more intensely) may not help motivate strategic emotion regulation, as high emotion differentiation is thought to do (Kashdan et al., 2015). Instead, it may reflect a painful awareness of the unpleasant circumstances of one's life and ultimately lead to judgments of poorer well-being. This finding complements Erbas and colleague's finding that greater within-category differentiation is positively associated with depression. Both findings seem to suggest that making greater distinctions among one's emotions is not always helpful for promoting well-being. This is not to say that higher NED is inherently bad. Raising NED is often a goal of emotional awareness training, which when done with the guidance of a clinician could increase one's ability to use the fine-grained distinctions to regulate one's emotions well instead of dwelling on one's difficult situation.

In contrast to previous work (e.g., Demiralp et al., 2012), PED exhibited a consistent, albeit weak, negative association with depression, even when accounting for mean-level PA. PED also showed a consistent pattern of moderation across samples. The effect of PED is much more pronounced among people low in PA. Although low levels of PA are associated with

elevated levels of depression, this appears to be particularly true among individuals with low levels of PED and less true for people with high levels of PED. The results indicate that increasing PA should be a primary goal for mitigating depression, rather than increasing PED. However, to the extent that one differentiates between pleasant emotional experiences, it may be easier to conduct interventions that aim to increase PA, such as behavioral activation. For example, being able to plan activities that are exciting, calming, and fun should result in greater (or faster) increases in PA, rather than just activities that one anticipates will feel “good.”

On the other hand, high PED magnifies the association between PA and life satisfaction, such that high PED is beneficial for life satisfaction at high levels of PA but harmful at low levels of PA. It may be that people must reach a certain PA baseline before making the distinctions among their pleasant emotional states can lead to a more satisfying and enriching life. For someone low in PA, it may be difficult to imagine having a more satisfying emotional life beyond feeling happy. Like having high NA and NED, having low PA but high PED, may function as a painful reminder of the pleasant experiences one is not having. In contrast, for someone who already experiences higher levels of PA, differentiating between different pleasant experiences such as going on exciting adventures, feeling contented with their job, and meditating to feel tranquil, may enhance their perception of how satisfying their life is. Positive emotions are thought to broaden one’s resources and attention to their environment (Fredrickson, 1998) and can create upward spirals of experiencing even more PA (Fredrickson, 2001). Experiencing greater PA is also linked to more variety-seeking (Kahn & Isen, 1993). Therefore, experiencing greater mean-levels of PA may allow for more variety in the types of pleasant emotions and experiences a person seeks out, which should contribute to a richer, more satisfying life.

Somewhat surprisingly, the differentiation indices derived from daily, annually, quadrennially, and retrospectively reported emotions were similar in their means, distributions, and associations with psychological well-being. Emotion differentiation is typically thought of as a between-person trait. Our results suggest that this trait can be similarly estimated across relatively short to relatively long timeframes. Recently, Erbas and colleagues (2021) derived a measure of within-person fluctuations in emotion differentiation. To the extent that emotion differentiation's association with psychological well-being depends on contextual factors, within-person deviations in emotion differentiation could reveal in what contexts/situations emotion differentiation is more or less important for well-being. Figuring out both for whom and when emotion differentiation matters is an important direction for clarifying how and why emotion differentiation promotes well-being.

Both socioemotional selectivity theory (Carstensen, 1992) and dynamic integration theory (Labouvie-Vief & González, 2004) suggest that emotion differentiation may increase with age (up to an extent, then limited by cognitive decline). Despite evidence in the literature of increased emotional complexity with age (Ong & Bergemen, 2004), and even increased differentiation (Ready et al., 2008; Ready et al., 2019), we found very weak bivariate associations between age and emotion differentiation. Though prior evidence has largely fallen in line with these theory-driven predictions, most of the evidence in the literature comes from small samples comparing older and younger adults. To our knowledge this is the largest scale test of the hypothesis that emotion differentiation would increase with age -- we found evidence for a very weak positive association when looking across adulthood. Chronological age does not take important factors such as cognitive decline or meta-cognitive ability into account, which should influence how emotion differentiation develops over time. Therefore, it may be possible

that emotion differentiation may enhance well-being in certain situations, but it is unlikely that increases in emotional health associated with age are being driven by increased specificity in emotion representation.

### **Limitations and Future Directions**

The present study is not without limitations that should be addressed in future work. First, although data was available for over 10,000 participants, the samples were predominantly White. Data were drawn from three large-scale longitudinal studies that made efforts to sample participants that are representative of national populations. However, there were less consistently available (i.e., non-missing) data from non-White participants. Moving forward, efforts to make the research process more equitable, such as increasing representation of non-White researchers and partnering with community organizations (Andrews, Parekh, Peckoo, 2019), will be important for retaining non-White representation in longitudinal studies and ultimately learning about their lived experiences and increasing emotional health in culturally congruent ways. The online UIUC-AS sample, though not completely unselected, only had a small set of criteria to determine participant eligibility. This suggests White participants may over-represent the average participant in an online study. Considering the amount of psychology research that moved online due to the impact of COVID-19, creative solutions and strategies will need to be employed to ensure that continued online psychological research is adequately representative of the populations psychologists hope to learn about. To the extent that emotion differentiation truly represents individual differences in the psychological representation of one's emotional experiences, culture, racial, and ethnic identity, which are linked to social rules about which emotions are acceptable to feel and express (Matsumoto, 1990; Markus & Kitayama, 1991; Tsai, 2007), should shape emotion differentiation's relevance for psychological well-being.

The current study begins to demonstrate some of the potential boundary conditions for when emotion differentiation does and does not promote psychological well-being. Previous work has demonstrated differences in emotion differentiation across clinical vs. healthy control samples (e.g., Demiralp et al., 2012; Zaki et al., 2013). The present study did not include explicitly clinical or treatment-seeking samples, which are important for understanding the severe manifestations of depression. However, the present samples include people across the continuum of functioning, which better represents how depression tends to manifest in the general public. When examining the full continuum of depressive symptoms, we did not find strong bivariate associations between depression and emotion differentiation, suggesting this link may be more complex than initially thought. To the extent emotion differentiation is a target of clinical intervention, future work should continue to clarify for whom and when emotion differentiation mitigates depression.

One potential issue involves the measurement of emotion differentiation. In the present study, we used the field-standard method of using the ICC of repeated assessments of emotion ratings. However, it is not clear that this method most directly assesses the specificity of people's mental representations of emotions. Other methods have been used to assess emotion differentiation or granularity, such as the number of eigenvalues over 1 produced from within person factor analyses of repeated emotion assessments, but similarly give only an indirect window into the mental representation of different emotions. Ready et al. (2019) used a novel method of having participants rate the level of similarity between pairs of emotions. This method circumvents the need for longitudinal or intensive longitudinal (e.g., daily diary, ecological momentary assessment) data that is often used to calculate ICCs. Emotion differentiation tasks such as those used in the current study or Erbas et al. (2019) also avoid the need for longitudinal



data, but similarly rely on ICCs of repeated emotion assessments as an indirect assessment of how similar/different the emotions are mentally represented. Future work should continue to test novel approaches such as the one used in Ready et al. (2019) to more directly assess how similarly/differently emotions are mentally represented. Given that indirect measures typically show weaker associations with direct measures, it is less surprising that emotion differentiation, in this study and in other recent work, does not seem to be strongly related to self-reports of well-being. More direct assessments of emotion differentiation may reveal the stronger, expected associations with well-being, or provide greater evidence that emotion differentiation is not strongly associated well-being.

Some factors that are strongly linked to depression and life satisfaction, such as stress, were not available across datasets. In an effort to increase the reproducibility of our results, we only included variables that were available in at least three of the four datasets. Unfortunately, measures of mean-level NA and PA were not available for all participants in the UIUC-AS sample, which reduced the power to detect smaller effects in regression analyses for that sample. In general, we strived to interpret results that replicated across samples (as well as the meta-analyzed correlations) with more certainty (McShane & Böckenholt, 2017).

## **Conclusions**

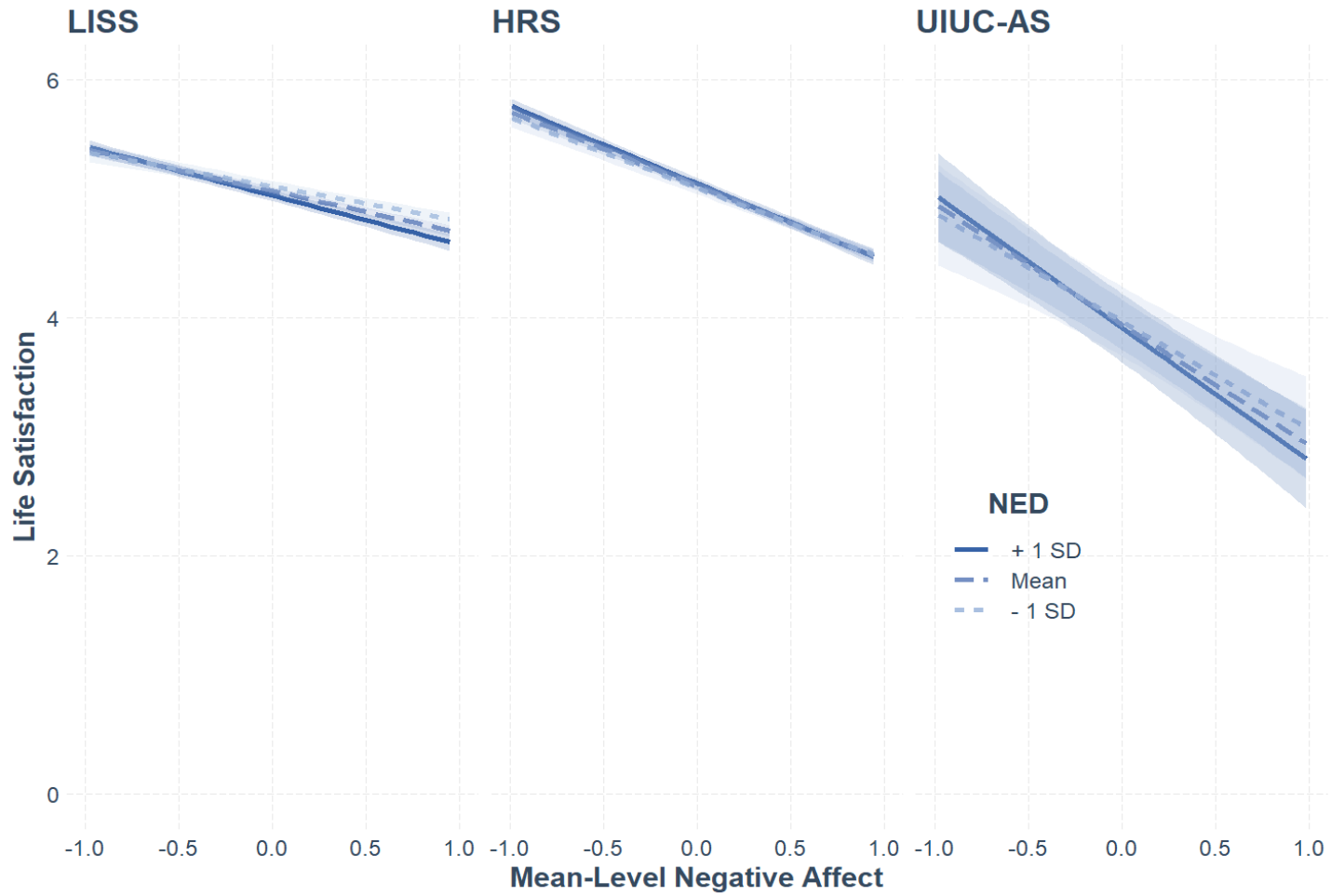
Across several large samples, we demonstrated that although NED and PED are weakly linked to psychological well-being in a bivariate context, they moderate the associations between mean-level affect and well-being. In particular, high NED and PED appear to enhance the effects of low NA and high PA, respectively, on psychological well-being, but may have a harmful effect on well-being for people already high in NA or low in PA. This study represents an

important step for understanding for whom emotion differentiation may promote psychological well-being.

## FIGURES AND TABLES

**Figure 2.1**

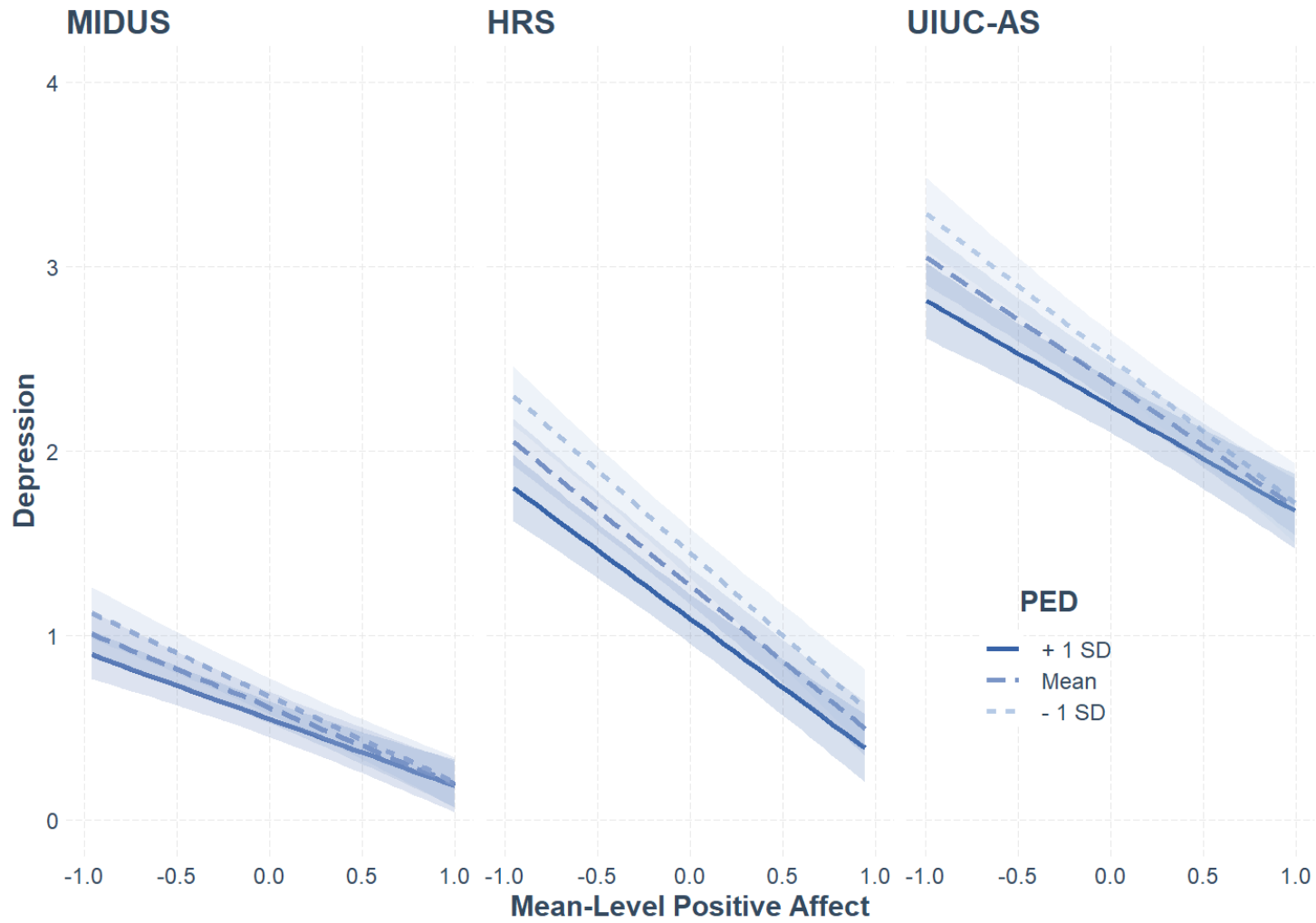
*Simples Slopes of NED moderating the association between Mean-Level Negative Affect and Life Satisfaction*



*Note.* NED = Negative Emotion Differentiation

**Figure 2.2**

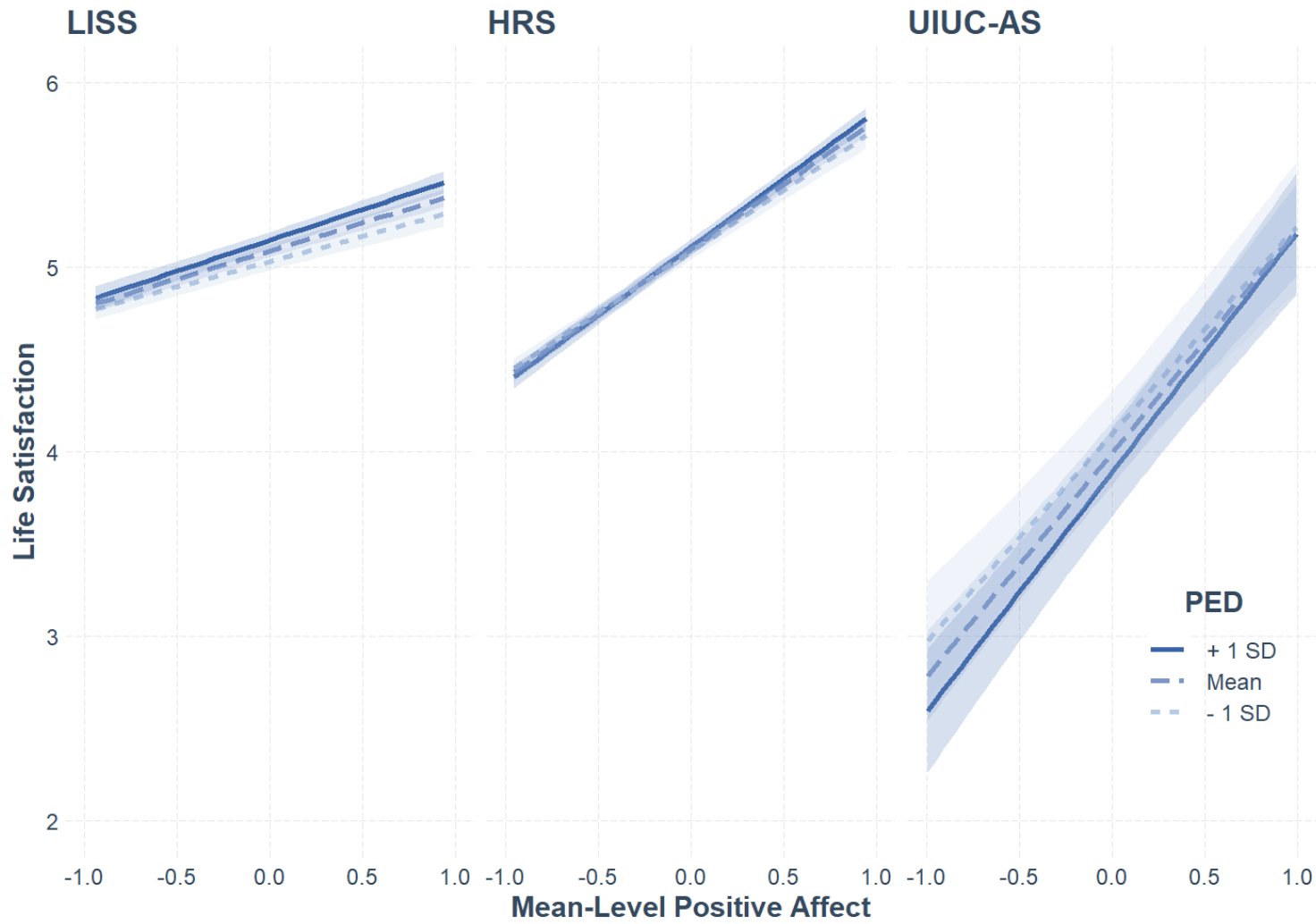
*Simples Slopes of PED moderating the association between Mean-Level Positive Affect and Depression*



Note. PED = Positive Emotion Differentiation

**Figure 2.3**

*Simples Slopes of PED moderating the association between Mean-Level Positive Affect and Life Satisfaction*



*Note.* PED = Positive Emotion Differentiation

**Table 2.1***Descriptive Statistics for Study Two Variables*

	HRS	LISS	MIDUS	UIUC-AS
<i>Age</i>				
Mean (SD)	64.6 (9.1)	53.4 (14.9)	56.5 (12.2)	52.3 (13.9)
Range	28 – 93	18 – 90	33 – 84	25 – 81
<i>NED</i>				
Mean (SD)	.42 (.25)	.31 (.26)	.48 (.22)	.35 (.22)
Range	.00 – 1.00	.00 – 1.00	.02 – 1.00	.02 – 1.00
<i>PED</i>				
Mean (SD)	.31 (.25)	.39 (.23)	.36 (.25)	.29 (.22)
Range	.00 – 1.00	.00 – 1.00	.00 – 1.00	.02 – .98
<i>NA</i>				
Mean (SD)	1.7 (.5)	1.9 (.8)	1.2 (.3)	2.2 (.8)
Range	1.0 – 4.3	1.0 – 6.0	1 – 4.1	1.0 – 4.0
<i>PA</i>				
Mean (SD)	3.7 (.7)	4.4 (.8)	3.7 (.7)	2.9 (.9)
Range	1.0 – 5.0	1.8 – 6.7	1.0 – 5.0	1.0 – 4.8
<i>Life Satisfaction</i>				
Mean (SD)	5.1 (1.2)	5.1 (.9)	--	4.0 (1.6)
Range	1.0 – 7.0	1.4 – 7.0	--	1.0 – 7.0
<i>Depression</i>				
Mean (SD)	1.3 (2.4)	--	.6 (1.7)	2.3 (1.0)
Range	0 – 8.0	--	0 – 7.0	1.0 – 5.0

**Table 2.2**

*Pearson Correlations between Negative Emotion Differentiation, Mean-Level Negative Affect, Age, and Well-Being*

	Negative Emotion Differentiation				Mean-Level Negative Affect			
	HRS	LISS	MIDUS	UIUC-AS	HRS	LISS	MIDUS	UIUC-AS
<i>Depression</i>								
<i>r</i>	-.09		-.07	-.10	.47		.26	.78
<i>n</i>	1685		1140	301	2586		1842	190
<i>Life Satisfaction</i>								
<i>r</i>	.11	.09		.05	-.51	-.39		-.62
<i>n</i>	3286	2580		302	5047	2949		190
<i>Age</i>								
<i>r</i>	.07	.09	.03	.08	-.16	-.18	-.20	-.18
<i>n</i>	3286	2579	1140	302	5047	2949	1842	190

**Table 2.3**

*Pearson Correlations between Positive Emotion Differentiation, Mean-Level Positive Affect, Age, and Well-Being*

	Positive Emotion Differentiation				Mean-Level Positive Affect			
	HRS	LISS	MIDUS	UIUC-AS	HRS	LISS	MIDUS	UIUC-AS
<i>Depression</i>								
<i>r</i>	-.10		-.04	-.11	-.33		-.25	-.68
<i>n</i>	2084		1522	336	2586		1842	190
<i>Life Satisfaction</i>								
<i>r</i>	.08	.11		.00	.57	.36		.73
<i>n</i>	4003	2581		337	5047	2950		190
<i>Age</i>								
<i>r</i>	.05	.15	.02	.05	.01	.04	.20	.12
<i>n</i>	4003	2580	1522	337	5047	2950	1842	190



**Table 2.4**

*Weighted Average Correlations between Emotion Differentiation, Mean-Level Affect, Age, and*

*Well-Being*

	Differentiation		Mean-Level	
	NED	PED	NA	PA
<i>Depression</i>				
<i>r</i>	-.08	-.08	.41	-.32
<i>Life Satisfaction</i>				
<i>r</i>	.10	.09	-.47	.51
<i>Age</i>				
<i>r</i>	.07	.08	-.17	.06

**Table 2.5**

*Hierarchical Multiple Regressions Predicting Depression and Life Satisfaction from Mean-Level Negative Affect and Negative Emotion Differentiation*

Depression	MIDUS					HRS					UIUC-AS				
	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$
Step 1				0.07					0.23					0.63	
NA	0.27	<.001	.07			0.48	<.001	.22			0.79	<.001	.62		
NED	-0.01	0.75	<.001			0.01	0.62	<.001			-0.08	0.1	.01		
Step 2				0.07	.00 <sup>a</sup>				0.23	.00 <sup>b</sup>				0.63	.00 <sup>c</sup>
NA	0.18	0.01	.01			0.44	<.001	.05			0.71	<.001	.10		
NED	0.01	0.82	<.001			0.02	0.32	<.001			-0.09	0.08	.01		
NA*NED	-0.12	0.13	.002			-0.06	0.19	.001			-0.09	0.45	.001		
Life Satisfaction	LISS					HRS					UIUC-AS				
	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2_{\beta}$	$R^2$	$\Delta R^2$
Step 1				0.14					0.25					0.38	
NA	-0.38	<.001	.14			-0.5	<.001	.23			-0.62	<.001	.38		
NED	-0.04	0.02	.002			0.01	0.59	<.001			-0.01	0.88	<.001		
Step 2				0.14	.00 <sup>d</sup>				0.25	.00 <sup>e</sup>				0.38	.00 <sup>f</sup>
NA	-0.51	<.001	.06			-0.55	<.001	.08			-0.75	<.001	.11		
NED	-0.05	0.02	.002			0.02	0.25	<.001			-0.02	0.79	<.001		
NA*NED	-0.12	<.001	.005			-0.06	0.04	.001			-0.15	0.32	.004		

*Note.* NA = Mean-Level Negative Affect using the same items as NED calculation; NED = Negative Emotion Differentiation;  $R^2_{\beta}$  = Semi-partial  $R^2$  effect size for the predictor; <sup>a</sup>  $F(1, 1136) = 2.31, p = .13$ ; <sup>b</sup>  $F(1, 1681) = 1.69, p = .19$ ; <sup>c</sup>  $F(1, 148) = .57, p = .45$ ; <sup>d</sup>  $F(1, 2535) = 14.35, p < .001$ ; <sup>e</sup>  $F(1, 3281) = 4.01, p = .05$ ; <sup>f</sup>  $F(1, 148) = 1.01, p = .32$ .

**Table 2.6**

*Hierarchical Multiple Regressions Predicting Depression and Life Satisfaction from Mean-Level Positive Affect and Positive Emotion Differentiation*

	<i>MIDUS</i>					<i>HRS</i>					<i>UIUC-AS</i>				
Depression	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta P^2$	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta P^2$	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta R^2$
Step 1				.05					.13					.48	
PA	-.23	<.001	.05			-.33	<.001	.11			-.67	<.001	.45		
PED	-.06	.01	.004			-.09	<.001	.01			-.15	.01	.02		
Step 2				.06	.01 <sup>a</sup>				.13	.00 <sup>b</sup>				.49	.01 <sup>c</sup>
PA	-.13	.01	.004			-.27	<.001	.02			-.43	<.001	.04		
PED	-.07	.01	.005			-.08	<.001	.01			-.14	.01	.02		
PA*PED	.11	.03	.004			.05	.11	.001			.23	.03	.01		
	<i>LISS</i>					<i>HRS</i>					<i>UIUC-AS</i>				
Life Satisfaction	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta R^2$	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta P^2$	$\beta$	<i>p</i>	$R^2_{\beta}$	$R^2$	$\Delta R^2$
Step 1				.12					.31					.51	
PA	.33	<.001	.11			.56	<.001	.30			.72	<.001	.52		
PED	.07	<.001	.005			.01	.52	<.001			-.07	.18	.005		
Step 2				.12	.00 <sup>d</sup>				.31	.00 <sup>e</sup>				.51	.00 <sup>f</sup>
PA	.40	<.001	.03			.62	<.001	.09			.84	<.001	.14		
PED	.07	<.001	.005			.01	.40	<.001			-.07	.20	.004		
PA*PED	.09	.06	.002			.06	.01	.001			.11	.29	.004		

*Note.* PA = Mean-Level Positive Affect using the same items as PED calculation; PED = Positive Emotion Differentiation;  $R^2_{\beta}$  = Semi-partial  $R^2$  effect size for the predictor; <sup>a</sup>  $F(1, 1508) = 4.98, p = .03$ ; <sup>b</sup>  $F(1, 2080) = 2.57, p = .11$ ; <sup>c</sup>  $F(1, 184) = 20.15, p < .001$ ; <sup>d</sup>  $F(1, 2576) = 3.56, p = .06$ ; <sup>e</sup>  $F(1, 3997) = 6.03, p = .01$ ; <sup>f</sup>  $F(1, 165) = 1.12, p = .29$ .

## CHAPTER 4: GENERAL DISCUSSION

The present studies illustrate that emotional factors outside the direct experience of emotion are important to consider for well-being. Both studies demonstrate that individual differences in people's understanding and mental representation of their emotions (and goals in Study 1) have implications for mental health and well-being. These findings have implications for our understanding of aging and well-being as well as for clinical interventions.

### **Implications for Aging**

The present studies provide evidence for what may, and what may not, be fruitful avenues for further research into emotional well-being and aging. Although theory-driven hypotheses about emotion regulation have been made in line with socioemotional selectivity theory, these have not been supported by empirical evidence (e.g., Shiota & Levenson, 2009; Opitz et al., 2014; English & Eldesouky, 2018; Benson et al., 2019; Growney & English, 2020). In contrast, using the same theoretical framework, we found evidence that emotional clarity does appear to increase with age. Most of the work linking emotional clarity to well-being, and to our knowledge, the entirety of the work linking emotional clarity to better problem solving, coping, and emotion regulation, has been done with adults younger than 65. Greater attention should be directed to studying emotional clarity in older adulthood. Further, Study 1 focused on between-person differences in emotional clarity, but examining within person variation could help to determine how emotional clarity could promote healthy coping and well-being on a moment-to-moment or day-to-day basis for adults across the lifespan.

Similar to emotion regulation, the results of Study 2 suggest emotion differentiation may not be useful to continue studying within the context of aging. Evidence for increasing emotional complexity, which involves increased differentiation, has been found largely in the context of

small studies (e.g., Ong & Bergemen, 2004; Ready et al., 2008; Ready et al. 2019) and contextualized within dynamic integration theory (Labouvie-Vief & González, 2004). Our large-scale test of the association between age and emotion differentiation suggested their association is very weak. Dynamic integration theory (Labouvie-Vief & González, 2004) suggests emotion differentiation may reflect an age-graded process of cognitive influence on emotion. Specifically, organization of emotion experience is thought to be important for working towards long term goals. Among older adults, increased perceptions of time limitations, are thought to shift goals to be more emotionally meaningful in the short-term (Carstensen, 1992). Dynamic integration theory also predicts that older adults would likely shift their goals towards affective optimization (i.e., maximizing pleasure, minimizing pain), potentially rendering differentiation less useful. In older adulthood, it may be less useful to distinguish among emotional states in working towards developmentally appropriate goals. However, being able to clearly understand one's feelings, which should also reflect increased cognitive-affective integration, may be more helpful for shifting behavior towards relevant goals and monitoring goal progress.

### **Implications for Clinical Intervention**

The present research provides several potential tips that can inform emotional awareness interventions. First, the results of Study 1 suggest that emotional clarity and goal clarity are moderately linked traits that are both associated with depression and life satisfaction. Interventions that only teach what emotions feel like will likely be less effective than interventions that help make connections between one's emotions and goals. Helping a person to more clearly understand what they feel, what they want to do, and how to use information from their feelings to facilitate their goal attainment should have a greater positive impact on mental health than learning about emotions or clarifying goals alone. Second, Study 2 suggests that

learning to differentiate among emotions is not always helpful, especially when someone is experiencing very low positive affect or very high negative affect. Learning about emotions should be done in such a way as to not encourage rumination about the unpleasant circumstances of one's life. Third, that emotional clarity increased across the lifespan suggests that experiencing emotions is important for being able to understand them. If this is the case, emotional awareness interventions that focus exclusively on psychoeducation should be less effective than those that combine psychoeducation and experiential learning. Among those low in emotional clarity, experiencing emotions is likely not enough on its own to increase emotional clarity. Experiential learning should either be guided or accompanied by psychoeducation and reflection on experience to solidify learning from one's experiences. In order to increase experience, practice with identifying one's emotions and what they may be signaling outside of therapy sessions should be an important part of the intervention.

Experiential learning is an approach currently taken in several forms of emotional awareness training, including what is done in mindfulness based interventions (Phillipot & Segal, 2009) and the Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2017). Anecdotally from my own clinical experience, I have found that older adults tend to understand and apply lessons from emotional awareness training more easily than young adults. Various factors may explain this, including increased treatment engagement, but it may be that the foundation for learning about emotions is set from years of experiencing one's emotions. The latter explanation is consistent with latent learning theory (i.e., in the absence of reward learning, people still learn through experience without necessarily being aware that they are learning; Tolman, 1948). Emotional awareness training with older adults may be easier because they have implicitly learned about their emotions and the training is making the

knowledge explicit, rather than learning it for the first time. Ultimately, this is empirical question for future work to address.

### **Future Directions**

Among the various facets of emotional awareness, clarity and differentiation are the most conceptually similar, to the point that they are often discussed interchangeably. The present studies provide some of the strongest evidence that they are distinguishable because they function quite differently in the context of aging. Moreover, the present studies, along with a handful of previous work (e.g., Boden et al., 2013; Erbas et al., 2014), demonstrate that these traits have different implications for well-being and emotional processing. Continuing to examine their differential functions will be important in clarifying their unique roles in promoting psychological well-being.

Previous work has suggested that, at least among young-to-middle age adults, emotional clarity is transdiagnostically linked to various forms of psychopathology (Vine & Aldao, 2014; Boden & Thompson, 2015; Sperry et al., 2021; Eckland & Berenbaum, 2021). Study 1 demonstrates that emotional clarity is linked to depression and life satisfaction across adulthood. However, we should not assume that associations found between emotional clarity and well-being among younger adults will always hold true for older adults. Further examination of the links between emotional clarity other forms of psychopathology (e.g., worry, alcohol abuse, emotional eating), other positive indicators of well-being (e.g., active coping, health behaviors, social connectedness), and dynamics of day-to-day emotional experiences will help contextualize how emotional clarity functions within older adulthood. A major motivation for the present research was to understand factors that may explain why some older adults experience the best emotional health of their lives, whereas others experience their worst (e.g., first time episodes of

depression). Emotional clarity appears to be a potentially promising explanation for this variability. More work will be needed to examine whether late-life depression can be characterized by low emotional clarity, as is the case for depression at other life stages. Late-life depression often has fewer affective symptoms and greater disruptions to cognition and motivation (Fiske et al., 2009). To the extent that understanding one's feelings can promote goal progress, increasing understanding of emotions and how they can provide useful information may help to relieve some of the symptoms of late-life depression.

To date, there are a plethora of emotional awareness training interventions (both as an explicit intervention goal or as an implicit goal) contained within multi-component cognitive behavioral therapies. For example, explicit emotional awareness training occurs in the Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2017) and Trauma-Focused Cognitive Behavioral Therapy (Cohen et al., 2010). Emotion identification training is built into the emotion regulation skills module of Dialectical Behavior Therapy (Lynch et al., 2006). Mindfulness-based interventions often involve inquiry and awareness raising about the physical sensations associated with one's emotional experiences (Phillipot & Segal, 2009). There are also stand-alone interventions developed for emotional awareness training (e.g., Farrell & Shaw, 1994). Though these interventions share some aspects (e.g., often including psychoeducation about emotions), they differ in their methods, length, and goals. Furthermore, dismantling studies of these multi-component therapies have not examined the efficacy of emotional awareness training for improving either emotional awareness or treatment outcomes. It is not clear for whom and under what circumstances emotional awareness training is warranted or which methods are most effective for increasing emotional awareness. These issues



will need to be addressed if empirical findings regarding emotional awareness and well-being are to be translated to clinical interventions.

## **Conclusion**

The view that well-being is the presence of pleasant emotions and absence of unpleasant emotions oversimplifies the complexity and evolutionary purpose of having emotions. Since emotions can function as signals for goal progress, being able to understand and read those signals should facilitate meeting goals and promoting well-being. Continuing to examine how factors outside the direct experience of emotion can influence emotional experience, goal attainment, and ultimately well-being will be important for translating basic science findings into effective clinical intervention.

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**APPENDIX A: STUDY ONE SUPPLEMENTAL MATERIALS**

**Section A1: Supplemental Materials for Analyses in Main Manuscript**

**Table A.1***Factor Loadings from Confirmatory Factor Analyses of Emotional and Goal Clarity with Items as Indicators*

Item	One-	Two-		Bifactor			I-ECV
	Factor Clarity	Emotion	Goal	Common	Emotion	Goal	
TC 1: I am often confused about what emotion I am feeling	.82	.83		.57	.82	--	.33
TC 2: When I am upset, I don't know if I am sad, frightened, or angry	.68	.68		.64	.23	--	.88
TC 3: I have feelings that I can't quite identify	.86	.86		.81	.30	--	.88
TC 4: I don't know what's going on inside me	.77	.77		.75	.23	--	.92
TC 7: I can't make sense out of my feelings	.77	.77		.72	.26	--	.88
TC 8: I am rarely confused about how I feel	.76	.76		.72	.24	--	.90
TC 12: I almost always know exactly how I am feeling	.74	.74		.69	.38	--	.86
TC 13: I am usually confused about how I feel	.83	.83		.75	.34	--	.83
SC 6: I often have to search for a reason why I am sad, angry, or scared	.72	.72		.65	.30	--	.82
GC 1	.24		.48	.25	--	.28	.44
GC 2	.21		.55	.21	--	.50	.16
GC 3	.31		.67	.33	--	.58	.24
GC 4	.40		.87	.40	--	.75	.22
GC 5	.28		.86	.28	--	.85	.10
GC 6	.34		.88	.33	--	.84	.14

*Note.* TC = Emotional Clarity of Type Item; SC = Emotional Clarity of Source Item; GC = Goal Clarity Rating; I-ECV = Item explained common variance from the Bifactor Model.

## Section A2: Supplemental Analyses using Parcels

### Initial Measurement Model Selection

Items with their factor loadings and parcel assignments are shown in Table S1. We began by examining the four originally hypothesized models shown in Figure S1 (Factor Loadings are given in Supplemental Table S2). The one-factor had poor fit to the data,  $\chi^2(27) = 619.57$ ,  $p < .001$ , CFI = .846, RMSEA = .176, SRMR = .097. Fit improved for the two-factor model, but was still relatively poor,  $\chi^2(26) = 286.97$ ,  $p < .001$ , CFI = .932, RMSEA = .119, SRMR = .038. The emotional and goal clarity factors had a moderate latent correlation  $r = .36$ ,  $p < .001$ . The three-factor model further improved model fit,  $\chi^2(24) = 64.64$ ,  $p < .001$ , CFI = .989, RMSEA = .049, SRMR = .023. The goal clarity factor was moderately correlated with the type clarity factor,  $r = .36$ ,  $p < .001$ , and the source clarity factor,  $r = .31$ ,  $p < .001$ . However, the two emotional clarity factors were so strongly associated that is likely they were reflecting the same latent construct,  $r = .85$ ,  $p < .001$ . The bifactor model had the best fit to the data,  $\chi^2(18) = 18.75$ ,  $p = .41$ ; CFI > .999; RMSEA = .008; SRMR = .009. The general factor explained nearly all the variance in the type clarity parcels (all I-ECVs = .99), substantial variance in the source clarity parcels (I-ECVs = [.72, .66, .74]), and comparably less variance in the goal clarity parcels (I-ECVs = [.23, .10, .11]). The ECV of the general factor was .60. For the common factor,  $\omega_H = .63$ . For the emotional clarity factor,  $\omega_{HS} = .001$ , indicating essentially no reliable variation remaining in emotion-specific clarity after taking into the general factor into account. Finally, for the goal clarity factor,  $\omega_{HS} = .13$ . Taken together, the bifactor model does not appear to be modeling common psychological clarity, but rather partitioning all of the variance from the emotional clarity (in particular type clarity) parcels into the common factor. Since neither the bifactor model nor next-best fitting three-factor model provide adequate factor structures, we re-parceled

the emotional clarity of type and source items together using the method described in the analytic plan. Re-parceled emotional clarity items are shown in Table S3.

## **Models Using Parcels**

### **Goal 1: Testing the Structure of Emotional and Goal Clarity**

Results from CFAs testing the structure of emotional and goal clarity are shown in Table S4. After re-parceling emotional clarity of type and source together, we retested a one-factor model, which again had poor fit to the data,  $\chi^2(9) = 336.17, p < .001, CFI = .841, RMSEA = .227, SRMR = .126$ . The two-factor model had good fit to the data across fit indices,  $\chi^2(8) = 12.64, p = .13, CFI = .998, RMSEA = .029, SRMR = .025$ . The emotional and goal clarity factors were moderately correlated,  $r = .38, p < .001$ . The bifactor model also had good fit to the data,  $\chi^2(3) = .86, p = .83; CFI > .999; RMSEA < .001; SRMR = .003$ . The general factor explained greater variance in the type clarity parcels (I-ECVs = [.58, .47, .61]), relative to the goal clarity parcels (I-ECVs = [.43, .18, .23]). The ECV of the general factor was .42. For the common factor,  $\omega_H = .45$ . For the emotional clarity factor,  $\omega_{HS} = .17$ . Finally, for the goal clarity factor,  $\omega_{HS} = .22$ . All factor loadings are shown in Supplemental Table 2. Given the emotional and goal clarity factors were only moderately correlated and the more parsimonious two-factor model had excellent fit to the data, we proceeded with this two-factor model for subsequent multigroup analyses.

### **Goal 2: Examining Measurement Invariance Across Age Groups**

To test measurement invariance of the two correlated factors model across age groups, we tested a set of hierarchically nested models with increasing levels of constraint. All models individually replicated the strong fit to the data found when using the whole sample described above. The  $\chi^2$  difference tests indicated: (1) the metric invariance constraint did not significantly

worsen model fit from the configural model,  $\Delta\chi^2(8) = 13.76, p = .09$ ; (2) the scalar invariance constraint did not significantly worsen model fit from the metric model,  $\Delta\chi^2(8) = 9.92, p = .27$ ; (3) the strict invariance constraint significantly worsened model fit from the scalar model,  $\Delta\chi^2(12) = 31.21, p = .002$ . The  $\Delta$ CFI tests indicated: (1) CFI dropped .003 from the configural to the metric model; (2) CFI dropped .001 from the metric to the scalar model; and (3) CFI dropped .01 from the scalar to the strict model. Both the  $\chi^2$  difference tests and  $\Delta$ CFI suggested that the scalar model could be interpreted, which allows for mean differences in latent constructs to be examined.

Results from the scalar model are shown in Table S5. The young-to-middle adults showed increased levels of emotional clarity relative to the emerging adults,  $z = 3.21, p = .001$ . In line with our hypothesis, the middle-to-older adult group showed the highest levels of emotional clarity relative to other groups,  $z = 8.31, p < .001$ . The young-to-middle adults also showed increased levels of goal clarity relative to the emerging adults,  $z = 2.23, p = .03$ . The middle-to-older adult group also showed higher levels of goal clarity relative to emerging adults,  $z = 2.75, p = .01$ , but this was only slightly higher than the young-to-middle adult group. Taken together, we found strong evidence of age differences in emotional clarity, such that young adults experience the lowest levels of emotional clarity and older adults experience the highest levels. There also appears to be an increase in goal clarity associated with maturing from emerging adulthood into young adulthood, but this increase is less pronounced for older participants.

We wanted to rule out the possibility that the differences we observed were due to methodological differences (i.e., data from emerging adults was collected in-person, whereas the two older samples were collected online). Therefore, we tested measurement invariance across

the two online samples, the young-to-middle and middle-to-older adult groups. The  $\chi^2$  difference tests indicated: (1) the metric invariance constraint did not significantly worsen model fit from the configural model,  $\Delta\chi^2(4) = 8.66, p = .07$ ; (2) the scalar invariance constraint did not significantly worsen model fit from the metric model,  $\Delta\chi^2(3) = 5.86, p = .12$ ; (3) and the strict invariance constraint did not significantly worsen model fit from the scalar model,  $\Delta\chi^2(7) = 6.79, p = .45$ . The  $\Delta$ CFI tests indicated: (1) CFI dropped .004 from the configural to the metric model; (2) CFI dropped .002 from the metric to the scalar model; and (3) CFI did not drop from the scalar to the strict model. These tests indicate that the strict invariance model was interpretable for comparing the young-to-middle and middle-to-older adult groups. This model replicated what was found comparing the three groups: (1) middle-to-older adults showed higher levels of emotional clarity relative to young-to-middle adults,  $z = 3.97, p < .001$ ; and (2) middle-to-older adults and young-to-middle adults did not significantly differ in levels of goal clarity,  $z = .20, p = .84$ .

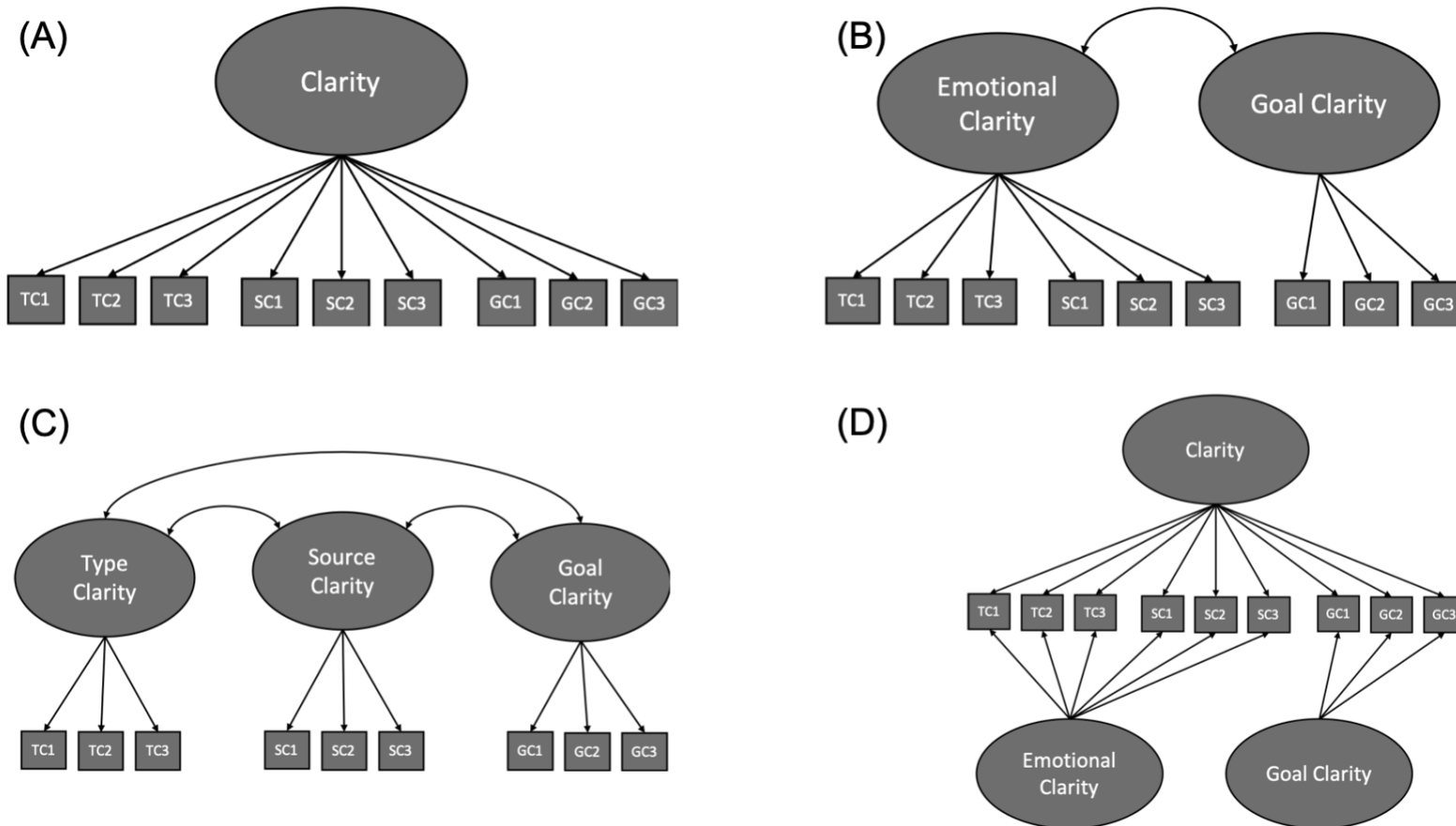
### **Goal 3: Examining Associations with Psychological Well-Being**

Finally, we tested an SEM adding depression and life satisfaction as correlated outcomes to the two-factor emotional and goal clarity model. We used the same hierarchical measurement invariance procedures described above. Again all models individually had strong fit to the data. The  $\chi^2$  difference tests indicated: (1) the metric invariance constraint did not significantly worsen model fit from the configural model,  $\Delta\chi^2(20) = 27.24, p = .13$ ; (2) the scalar invariance constraint significantly worsened model fit from the metric model,  $\Delta\chi^2(20) = 96.54, p < .001$ ; and (3) the strict invariance constraint significantly worsened model fit from the scalar model,  $\Delta\chi^2(28) = 107.04, p < .001$ . The  $\Delta$ CFI tests indicated: (1) CFI dropped .001 from the configural to the metric model; (2) CFI dropped .013 from the metric to the scalar model; and (3) CFI

dropped .014 from the scalar to the strict model. Both the  $\chi^2$  difference tests and  $\Delta$ CFI suggested that the metric model could be interpreted, which allows for comparisons of covariances and regression coefficients. Table S6 shows the results of the metric model. Among emerging adults, emotional clarity was associated with lower depression and higher life satisfaction. Goal clarity was not linked to depression in emerging adults, but was positively associated with life satisfaction. Among young-to-middle adults, emotional clarity was associated with lower depression and to a weaker extent higher life satisfaction. Among young-to-middle adults, goal clarity was also associated with higher life satisfaction, and to a weaker extent lower depression. The middle-to-older adults showed the same pattern as the young-to-middle adults. It is noteworthy that in line with our hypotheses, emotional clarity was more strongly linked with depression than was goal clarity, whereas goal clarity was more strongly linked to life satisfaction than was emotional clarity.

**Figure A.1**

*Four Proposed Structures for the Associations between Emotional and Goal Clarity.*



*Note.* Panel A depicts a unidimensional, single-factor model; Panel B depicts two correlated factors; Panel C depicts three correlated factors; and Panel D depicts a bifactor structure. TC = Type Clarity Parcel; SC = Source Clarity Parcel; GC = Goal Clarity Parcel.



**Table A.2***Initial Parceling of Emotional Clarity, Goal Clarity, and Depression Items*

Item	Factor Loading	Parcel #
<i>Type Clarity Items</i>		
I am usually confused about how I feel	0.82	TC1
I am often confused about what emotion I am feeling	0.81	TC1
I often don't know why I am angry	0.62	TC1
I am often puzzled by sensations in my body	0.55	TC1
I can't make sense out of my feelings	0.77	TC2
I almost always know exactly how I am feeling	0.75	TC2
When I am upset, I don't know if I am sad, frightened, or angry	0.67	TC2
I usually know my feelings about a matter	0.66	TC2
I have feelings that I can't quite identify	0.75	TC3
I don't know what's going on inside me	0.74	TC3
I can never tell how I feel	0.74	TC3
I am rarely confused about how I feel	0.69	TC3
I am usually clear about my feelings	0.67	TC3
<i>Source Clarity Items</i>		
It takes me a long time to figure out why I am happy or excited	0.75	SC1
It does not take me long to determine who made me sad, angry, or scared	0.53	SC1
I often have to think for a while to figure out what made me happy or excited	0.73	SC2
I usually don't know who caused me to become happy or excited	0.71	SC2
When I am sad, angry, or scared, I usually know who caused it	0.57	SC2
I sometimes have to think for a while to determine who made me happy or excited	0.72	SC3
I often have to think for a while to figure out who made me sad, angry, or scared	0.72	SC3
I often have to search for a reason why I am sad, angry, or scared	0.67	SC3
<i>Goal Clarity Ratings</i>		
Striving 4	.61	GC1
Striving 1	.36	GC1

**Table A.2 (cont.)**

Striving 6		.59	GC2
Striving 2		.44	GC2
Striving 5		.56	GC3
Striving 3		.51	GC3
	<i>Depression Items</i>		
Felt really bored		0.83	D1
Felt withdrawn from other people		0.61	D1
Felt unattractive		0.74	D2
Felt really slowed down		0.66	D2
Felt like nothing was very enjoyable		0.73	D3
Felt like there wasn't anything interesting or fun to do		0.72	D3
Felt like it took extra effort to get started		0.67	D3
Thought about death or suicide		--	--

*Note.* Emotional Clarity of type and source items were re-parceled together based on having high latent correlations in best fitting initial measurement model of emotional and goal clarity. Factor loadings are from EFA with oblique rotation, specifying one factor, using the full sample ( $n = 760$ ).

**Table A.3***Factor Loadings from Initial Confirmatory Factor Analyses of Emotional and Goal Clarity*

Parcel	One-Factor	Two-Factor		Three-Factor			Bifactor		I-ECV	
	Clarity	Emotion	Goal	Type	Source	Goal	Common	Emotion		Goal
TC 1	.71	.71		.71			.70	.08		.99
TC 2	.68	.68		.69			.68	.05		.99
TC 3	.69	.69		.72			.74	-.08		.99
SC 1	.50	.50			.54		.45	.29		.72
SC 2	.52	.52			.57		.48	.39		.66
SC 3	.65	.65			.71		.60	.35		.74
GC1	.29		.60			.60	.28		.52	.23
GC2	.26		.76			.76	.24		.74	.10
GC3	.27		.76			.76	.25		.72	.11

*Note.* I-ECV = Item explained common variance from the Bifactor Model.

**Table A.4***Re-parceling of Emotional Clarity Items based on One-Factor CFA*

Item	Factor Loading	Decision	Parcel #
TC 1: I am often confused about what emotion I am feeling	.81	Retain	2
TC 2: When I am upset, I don't know if I am sad, frightened, or angry	.71	Retain	1
TC 3: I have feelings that I can't quite identify	.82	Retain	1
TC 4: I don't know what's going on inside me	.76	Retain	2
TC 5: I often don't know why I am angry	.65	Drop	--
TC 6: I usually know my feelings about a matter	.51	Drop	--
TC 7: I can't make sense out of my feelings	.76	Retain	1
TC 8: I am rarely confused about how I feel	.73	Retain	2
TC 9: I am often puzzled by sensations in my body	.59	Drop	--
TC 10: I am usually clear about my feelings	.61	Drop	--
TC 11: I can never tell how I feel	.62	Drop	--
TC 12: I almost always know exactly how I am feeling	.74	Retain	3
TC 13: I am usually confused about how I feel	.81	Retain	3
SC 1: I often have to think for a while to figure out what made me happy or excited	.58	Drop	--
SC 2: When I am sad, angry, or scared, I usually know who caused it	.49	Drop	--
SC 3: I usually don't know who caused me to become happy or excited	.49	Drop	--
SC 4: It does not take me long to determine who made me sad, angry, or scared	.46	Drop	--
SC 5: It takes me a long time to figure out why I am happy or excited	.53	Drop	--
SC 6: I often have to search for a reason why I am sad, angry, or scared	.75	Retain	3
SC 7: I sometimes have to think for a while to determine who made me happy or excited	.56	Drop	--
SC 8: I often have to think for a while to figure out who made me sad, angry, or scared	.64	Drop	--

*Note.* TC refers to items originally intended to measure type clarity and SC refers to items

initially intended to measure source clarity. Items with factor loadings  $\lambda > .70$  were retained.

**Table A.5***Factor Loadings from Confirmatory Factor Analyses of Emotional and Goal Clarity with Re-**Parceled Emotional Clarity Items*

Parcel	One-Factor	Two-Factor		Bifactor			I-ECV
	Clarity	Emotion	Goal	Common	Emotion	Goal	
EC 1	.77	.77		.58	.50	--	.58
EC 2	.78	.78		.54	.58	--	.47
EC 3	.77	.77		.61	.48	--	.61
GC1	.31		.61	.39	--	.45	.43
GC2	.27		.75	.33	--	.71	.18
GC3	.29		.76	.36	--	.66	.23

*Note.* EC = Emotional Clarity Parcel; GC = Goal Clarity Parcel; I-ECV = Item explained common variance from the Bifactor Model.

**Table A.6***Multigroup Latent Means and Covariances Model of Emotional and Goal Clarity with Scalar Invariance Constraints*

Latent Variables	Emerging Adults			Young-to-Middle Adults			Middle-to-Older Adults		
	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$
Emotional Clarity									
EC1	.71	21.33	<.001	.84	21.33	<.001	.65	21.33	<.001
EC2	.72	21.20	<.001	.86	21.20	<.001	.66	21.20	<.001
EC3	.72	21.73	<.001	.85	21.73	<.001	.65	21.73	<.001
Goal Clarity									
GC1	.52	12.08	<.001	.69	12.08	<.001	.62	12.08	<.001
GC2	.66	13.53	<.001	.87	13.53	<.001	.78	13.53	<.001
GC3	.65	12.49	<.001	.86	12.49	<.001	.77	12.49	<.001
Covariances									
$r(\text{EC, GC})$	$r$	$z$	$p$	$r$	$z$	$p$	$r$	$z$	$p$
	.38	5.85	<.001	.38	3.97	<.001	.28	3.00	.003
Intercepts									
	Mean	$z$	Var	Mean	$z$	Var	Mean	$z$	Var
Emotional Clarity	0	--	1	.29	3.21**	1	.88	8.31***	1
Goal Clarity	0	--	1	.22	2.23*	1	.29	2.75**	1

*Note.* EC = Emotional Clarity; GC = Goal Clarity; \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

**Table A.7***Multigroup Latent Means and Covariances Model of Emotional and Goal Clarity Predicting Psychological Well-Being with Metric**Invariance Constraints*

	Emerging Adults			Young-to-Middle Adults			Middle-to-Older Adults		
	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$	$\lambda$	$z$	$p$
<b>Latent Variables</b>									
<b>Emotional Clarity</b>									
EC1	.71	21.12	<.001	.84	21.12	<.001	.65	21.12	<.001
EC2	.73	21.09	<.001	.86	21.09	<.001	.67	21.09	<.001
EC3	.71	21.56	<.001	.84	21.56	<.001	.65	21.56	<.001
<b>Goal Clarity</b>									
GC1	.53	12.10	<.001	.70	12.10	<.001	.63	12.10	<.001
GC2	.66	13.53	<.001	.87	13.53	<.001	.79	13.53	<.001
GC3	.64	12.47	<.001	.84	12.47	<.001	.76	12.47	<.001
<b>Life Satisfaction</b>									
LS1	1.28	19.65	<.001	1.84	19.65	<.001	1.68	19.65	<.001
LS2	1.06	18.44	<.001	1.52	18.44	<.001	1.40	18.44	<.001
LS3	1.23	19.67	<.001	1.77	19.67	<.001	1.62	19.67	<.001
LS4	.99	17.36	<.001	1.42	17.36	<.001	1.30	17.36	<.001
LS5	.92	14.46	<.001	1.32	14.46	<.001	1.21	14.46	<.001
<b>Depression</b>									
D1	.72	18.74	<.001	.95	18.74	<.001	.80	18.74	<.001
D2	.70	18.81	<.001	.93	18.81	<.001	.78	18.81	<.001
D3	.76	19.84	<.001	1.01	19.84	<.001	.85	19.84	<.001
<b>Covariances</b>									
$r(\text{EC, GC})$	.38	5.84	<.001	.38	3.98	<.001	.28	3.03	.002
$r(\text{LS, Dep})$	-.57	-11.78	<.001	-.46	-4.74	<.001	-.54	-5.26	<.001
<b>Regressions</b>									
EC $\rightarrow$ LS	$\beta$	$z$	$p$	$\beta$	$z$	$p$	$\beta$	$z$	$p$
	.28	3.97	<.001	.18	2.22	.03	.19	2.35	.02

**Table A.7 (cont.)**

EC → Dep	-.43	-6.09	<.001	-.47	-5.88	<.001	-.44	-5.57	<.001
GC → LS	.19	2.33	.02	.32	3.50	<.001	.35	3.78	<.001
GC → Dep	-.08	-1.06	.29	-.18	-2.16	.03	-.21	-2.48	.01

Note. EC = Emotional Clarity; GC = Goal Clarity; LS = Life Satisfaction; Dep = Depression.



## APPENDIX B: STUDY TWO SUPPLEMENTAL MATERIALS

### *List of Scenarios Used in Emotion Differentiation Task*

#### *Unpleasant Situations*

1. Think about the last time someone was rude to you. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
2. Think about the last time you had difficulty with an electronic device. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
3. Think about the last time you were in an argument or disagreement. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
4. Think about the last time something did not go the way you were hoping it would. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
5. Think about the last time you said something you wish you hadn't said. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)

#### *Pleasant Situations*

1. Think about the last time you ate your favorite meal. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
2. Think about the last time you went to a party. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
3. Think about the last time you spent time with someone you are close to. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
4. Think about the last time you rested after doing some hard work. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)
5. Think about the last time you learned something new. Please rate how you felt on the following scale 1 (Not at all) to 7 (Extremely)

**Table B.1**

*Hierarchical Multiple Regressions Predicting Depression and Life Satisfaction from Mean-Level Negative Affect and Negative Emotion Differentiation*

Depression	MIDUS				HRS				UIUC-AS					
	$\beta$	$p$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2$	$\Delta R^2$		
Step 1			.07				.24				.63			
NA	.27	<.001			.50	<.001			.79	<.001				
NED	-.01	.80			.01	.54			-.08	.10				
Step 2			.07	.00 <sup>a</sup>			.24	.00 <sup>b</sup>			.63	.00 <sup>c</sup>		
NA	.17	.01			.45	<.001			.71	<.001				
NED	.01	.76			.03	.29			-.09	.08				
NA*NED	-.13	.11			-.05	.23			-.09	.45				
			LISS				HRS				UIUC-AS			
Life Satisfaction	$\beta$	$p$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2$	$\Delta R^2$	$\beta$	$p$	$R^2$	$\Delta R^2$		
Step 1			.14				.25				.38			
NA	-.39	<.001			-.49	<.001			-.62	<.001				
NED	-.05	.01			.01	.60			-.01	.88				
Step 2			.15	.01 <sup>d</sup>			.25	.00 <sup>e</sup>			.38	.00 <sup>f</sup>		
NA	-.52	<.001			-.55	<.001			-.75	<.001				
NED	.14	<.01			.02	.26			-.02	.79				
NA*NED	-.13	<.001			-.06	.04			-.15	.32				

*Note.* NA = Mean-Level Negative Affect using the all available NA items; NED = Negative Emotion Differentiation; <sup>a</sup>  $F(1, 1136) = 2.51, p = .11$ ; <sup>b</sup>  $F(1, 1681) = 1.44, p = .23$ ; <sup>c</sup>  $F(1, 148) = .57, p = .45$ ; <sup>d</sup>  $F(1, 2535) = 16.49, p < .001$ ; <sup>e</sup>  $F(1, 3281) = 4.05, p = .04$ ; <sup>f</sup>  $F(1, 148) = 1.01, p = .32$ .

**Table B.2***Hierarchical Multiple Regressions Predicting Depression and Life Satisfaction from Mean-Level**Positive Affect and Positive Emotion Differentiation*

	<i>MIDUS</i>				<i>HRS</i>				<i>UIUC-AS</i>			
Depression	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$
Step 1			.05				.12				.48	
PA	-.23	<.001			-.33	<.001			-.67	<.001		
PED	-.06	.01			-.09	<.001			-.15	.01		
Step 2			.06	.01 <sup>a</sup>			.12	.00 <sup>b</sup>			.49	.01 <sup>c</sup>
PA	-.12	.02			-.28	<.001			-.43	<.001		
PED	-.07	.01			-.08	<.001			-.14	.01		
PA*PED	.12	.02			.05	.21			.23	.03		
	<i>LISS</i>				<i>HRS</i>				<i>UIUC-AS</i>			
Life Satisfaction	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$	$\beta$	<i>p</i>	$R^2$	$\Delta R^2$
Step 1			.10				.29				.51	
PA	.30	<.001			.54	<.001			.72	<.001		
PED	.06	.001			.01	.37			-.07	.18		
Step 2			.10	.00 <sup>d</sup>			.29	.00 <sup>e</sup>			.51	.00 <sup>f</sup>
PA	.37	<.001			.60	<.001			.84	<.001		
PED	-.11	.30			.01	.27			-.07	.20		
PA*PED	.08	.10			.06	.01			.11	.29		

*Note.* PA = Mean-Level Positive Affect using the all available PA items; PED = Positive Emotion Differentiation; <sup>a</sup>  $F(1, 1508) = 5.84, p = .02$ ; <sup>b</sup>  $F(1, 2080) = 1.56, p = .21$ ; <sup>c</sup>  $F(1, 184) = 20.15, p < .001$ ; <sup>d</sup>  $F(1, 2576) = 2.71, p = .10$ ; <sup>e</sup>  $F(1, 3997) = 6.89, p = .01$ ; <sup>f</sup>  $F(1, 165) = 1.12, p = .29$ .

**Table B.3***Correlations Among Mean-Level Affect and Emotion Differentiation*

HRS	PA	NA	PED	NED
PA	--			
NA	-.52	--		
PED	.17	-.09	--	
NED	.11	-.19	.15	--
MIDUS	PA	NA	PED	NED
PA	--			
NA	-.48	--		
PED	-.05	-.06	--	
NED	.05	-.22	.20	--
LISS	PA	NA	PED	NED
PA	--			
NA	-.01	--		
PED	.15	-.12	--	
NED	.05	-.30	.11	--
UIUC-AS	PA	NA	PED	NED
PA	--			
NA	-.63	--		
PED	.04	-.17	--	
NED	.02	-.09	.03	--
Weighted Average	PA	NA	PED	NED
PA	--			
NA	-.37	--		
PED	.12	-.10	--	
NED	.08	-.23	.14	--