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Structure and Demographic Correlates of Individual Trait Responses to Emotions

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Structure and Demographic Correlates of Individual Trait Responses to Emotions

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Arts and Sciences
at the University of Kentucky

By

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2020

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ABSTRACT OF THESIS

Structure and Demographic Correlates of Individual Trait Responses to Emotions

From a functionalist perspective, emotions inform people of their needs and influence responses to the environment. Responses to emotion encompass more than emotion regulation strategies. Individual differences emerge from the consistent way that people cope with their emotions, called trait responses to emotion (TRE). We hypothesized approach/avoidance and control/dyscontrol would characterize the dimensional structure of TRE and that dimensions would correlate with age, gender, and early life experiences. The present study developed a multidimensional model to explore TRE from a TurkPrime sample ($N = 284$). Participants completed a web-based battery of surveys with demographic, early life experience, and TRE questionnaires. Multidimensional scaling yielded 3 dimensions: approach, dyscontrol, and emotion engagement. Older participants had higher approach and dyscontrol. Female participants had higher dyscontrol and emotion engagement. Participants with less risky early life experiences had higher approach, and participants with riskier experiences had higher emotion engagement. Mapping the relationships of TRE constructs can establish their nomological net, and relationships to demographic characteristics can identify possible protective and risk factors for TRE development.

KEYWORDS: personality traits, emotions, multidimensional scaling, demographic correlates, early life experiences

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STRUCTURE AND DEMOGRAPHIC CORRELATES OF INDIVIDUAL TRAIT RESPONSES TO EMOTIONS

There are two prevailing views of the relationship between emotion, coping, and personality. Personality dimensions can impact a person's coping with stress, and the coping mechanisms then have an emotional effect: the top-down influence on the relationship between personality, coping, and emotion (Lazarus, 1999). The second view proposes that personality develops from people attempting to cope with their emotions: the bottom-up influence with personality emerging from the consistent way that people cope with their emotions (Segerstrom & Smith, 2019). Research and synthesis (e.g., meta-analysis) abounds on the top-down model but is lacking on the bottom-up model. This study focused on the bottom-up model. Constructs drawing on trait reaction to emotion are theoretically related and have important social and health implications, but there is not much literature on the empirical relationships among them (Segerstrom & Smith, 2019). The aim of this study was to develop a dimensional model of the empirical relationships between trait responses to emotion from a large, diverse sample and to explore the correlations between individuals' dimension scores and their early life experiences, gender, and age.

From a functionalist view, emotion plays a role in the coping process, influencing cognitive and behavioral responses to a person's environment (e.g., utilizing controlled or impulsive behaviors to manage an emotional experience). Emotions are also considered to be adaptive because they draw attention to what a person may need and can impact psychological and physical health outcomes in the long run. Trait responses to emotion can include control, approach, escape, and avoidance. Each of these trait responses is

reflected in personality dispositions, such as urgency, need for affect, and alexithymia (Segerstrom & Smith, 2019).

Trait Responses to Emotion

Control.

Generally, adults experience and then attend to emotion. Controlled behavior results in aligning management of an emotional experience with long-term interests and goals (Cyders & Smith, 2008). An example of a controlled approach to emotions would be experiencing a strong emotion, choosing not to act on that immediate feeling, and continuing to behave in a way that is in line with long-term interests; for example, choosing not to yell at your boss when you are feeling frustrated because you do not want to lose your job. In contrast, a maladaptive response in the control framework of trait response to emotion would be reacting impulsively to a strong emotion. Differences in the ability to control emotions include the trait of urgency. Urgency results in a tendency to act rashly and impulsively when experiencing intense emotions to deal with the immediate situation, inconsistent with long-term needs and goals (Settles et al., 2012; Smith & Cyders, 2016; Whiteside & Lynam, 2001). Urgency has an inverse relationship with control and includes two facets, positive and negative urgency, which refer to instances where a person acts rashly when in either highly positive or negative moods (Cyders & Smith, 2007). Elevated urgency has been associated with maladaptive outcomes, such as increased alcohol and tobacco use in adolescence (Guller, Zapolski, & Smith, 2015; Peterson & Smith, 2017; Settles, Zapolski, & Smith, 2014), elevations in

depressive symptoms (Smith, Guller, & Zapolski, 2013), and other forms of dysfunction and harm (Segerstrom & Smith, 2019).

Approach.

Individual differences in emotional approach can also result in personality dispositions such as need for affect, trait emotion-focused coping, and trait emotion expression (Segerstrom & Smith, 2019). For instance, those who are high in need for affect have more motivation to seek out and approach both positive and negative emotions and less motivation to avoid or escape both positive and negative emotions (Maio & Esses, 2001).

Emotional expression and emotional processing together are called emotional approach coping (EAC). People who are higher in approach dispositions toward emotion are more likely to utilize EAC strategies (Master et al., 2009). EAC has been associated with better adjustment outcomes across different samples, albeit not uniformly (Moreno, Wiley, & Stanton, 2018; Stanton, 2011). EAC is associated with better adjustment when the stressors are immediate and the social environment is non-hostile (Moreno et al., 2018).

Avoidance and Escape.

Escape involves taking action to prevent further discomfort when experiencing emotions to provide immediate relief from them. Avoidance involves taking preemptive action to prevent being in situations that may cause unwanted emotions. In the long term, escape-avoidance results in heightened levels of distress and is also associated with more anxiety and depression symptoms (Carver et al., 2008; Spinhoven, van Hemert, & Penninx, 2017). For instance, if a person who has a strong aversion to public-speaking

wishes to escape while giving an oral presentation, they may avoid making eye contact with their classmates to regulate their anxiety. As people experience emotions and the associated consequences from their emotion-driven behaviors, escape can develop into proactive avoidance via negative reinforcement. A person with a strong aversion to public-speaking may avoid enrolling in a course where public speaking is required to prevent the unwanted anxiety associated with public-speaking. People who experience higher trait negative emotion tend to utilize more avoidance and fewer approach strategies (Maio & Esses, 2001; Segerstrom & Smith, 2018).

Alexithymia, a complex personality construct, reflects difficulty identifying and communicating emotions and a tendency to focus on external rather than internal factors. People who are high in alexithymia report experiencing more negative than positive emotions, although theoretically they should be less in tune with their emotions than people who are low in alexithymia (Timoney & Holder, 2013). Women with high levels of alexithymia were more likely to distance themselves rather than express emotions or seek social support (Vingerhoets, Van Heck, Grim, & Bermond, 1995). Undergraduates high in alexithymia were more likely to utilize emotion-focused coping and avoidance rather than task-oriented coping (Parker, Taylor, & Bagby, 1998). Alexithymia is closely associated with escape-avoidant reactions to emotion. It can be argued that alexithymia involves avoiding recognizing emotions rather than escaping emotional experiences, which leads to difficulty in coping with emotions because alexithymic individuals are unaware of their emotional experiences and thus do not recognize effective coping strategies (Li, Zhang, Guo, & Zhang, 2015).

Demographic Characteristics

Demographic characteristics, such as age, gender, and early life experiences can positively and negatively influence the development and utilization of trait responses to emotion.

Age.

Motivation regarding emotions differs based on age. Younger adults tend to have less motivation than older adults to avoid negative emotion, which can explain why younger adults report more negative emotions compared with older adults (Charles, Reynolds, & Gatz, 2001; Riediger, Schmiedek, Wagner, & Lindenberger, 2009). Additionally, older adults may be more concerned with maintaining close emotional relationships and thus act in ways that decrease the experience of negative emotions (Carstensen & Charles, 1998; Carstensen, Isaacowitz, & Charles, 1999). As one ages, emotional functioning improves (Carstensen & Charles, 1998).

Older adults utilize more avoidance, suppression, and escape strategies when coping with emotion, and they are less likely to express emotions or seek social support than younger and middle-age adults (Blanchard-Fields, Stein, & Watson, 2004). This pattern may conserve resources, because negative emotions and direct confrontation with them can be taxing (Gross et al., 1997; Heckhausen & Schulz, 1995). Specifically, when dealing with intensely emotional situations, older adults prefer to utilize passive emotion-focused strategies, such as deliberate withdrawal and passive dependence and avoidance, compared with younger adults (Blanchard-Fields, Jahnke, & Camp, 1995).

Gender.

Gender-specific patterns in trait emotion response occur in emotion expression. Differences in emotion expression between genders are traced back to social and cultural contexts that result in gender stereotypic socialization where women are viewed as nurturers and men are viewed as providers (Brody & Hall, 1993; Jansz, 2000; Shields, 2002). Additionally, women may be more likely to endorse control over their negative emotions, particularly anger, to align with their interpersonal goals. Men may be more concerned with power dynamics (Timmers, Fischer, & Manstead, 1998).

Early Life Experiences/Adversity.

Early exposure to stressors has a negative effect on the neural development of children via alteration of the neuroendocrine system, which can result in negative behavioral outcomes such as internalizing behaviors (Cowan, Callaghan, Kan, & Richardson, 2016; McLaughlin, Fox, Zeanah, & Nelson, 2011). For instance, due to threshold changes in limbic reactivity from early-life adversity, adults may be more emotionally reactive in stressful situations, resulting in a lower ability to effectively engage in control-based emotion regulation strategies (Andersen, Lyss, Dumont, & Teicher, 1999; D'Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012; Thompson, 2011). Additionally, the relationships between early-life adversity and mental health problems can be further explained by maladaptive emotion coping strategies, which can be rooted in higher cortisol reactivity and emotion dysregulation tendencies in childhood and can carry on into adulthood (Berking, 2012; Dvir, Ford, Hill, & Frazier, 2014; Ford, Fraleigh, Albert, & Connor, 2010; Lopez-Duran, Olson, Hajal, Felt, & Vazquez, 2009; Shields & Cicchetti, 1998).

The Proposed Study

The purpose of this study was to determine the empirical relationships among trait responses to emotion using a large, diverse sample. The first aim of this study was to develop a multidimensional model of the empirical relationships among trait responses to emotion to characterize their relationships. The second aim included exploring the correlations between each individual's dimension scores and demographic variables such as age, gender, and early life experiences. The study tested the following hypotheses:

1. Approach, avoidance, and control will characterize the dimensional structure of trait responses to emotion (i.e., approach vs. avoidance, control vs. dyscontrol).
2. Evidence suggests that individuals who are younger and/or are female will utilize more approach trait emotion responses; in contrast, individuals who are older and/or are male will utilize more avoidant trait emotion responses. Additionally, individuals who are older and/or female will utilize more control trait emotion responses than individuals who are younger and/or are male.
3. There is less evidence for the effects of early life experiences on approach and control trait emotion responses; exploratory analyses of the relationships between this variable and approach and control trait emotion responses were conducted.

METHOD

Participants

The participants for the proposed study were drawn from anonymous TurkPrime (MTurk) workers via an online survey posted to the TurkPrime website from late

February, 2020, to early March, 2020. TurkPrime is an upgraded version of the crowdsourcing website, MTurk, which is owned by Amazon and allows researchers and businesses to post surveys and tasks for users (known as MTurk workers) to complete for compensation. TurkPrime excludes bots and “farmers” through researcher-specified survey settings.

Participants were 284 TurkPrime workers who completed the survey for US \$5 in compensation. Participants ranged in age from 20-73 years old ($M = 38.8$, $SD = 11.8$). The sample was 52% male and 82.4% White. Participants were highly educated, with the majority of participants holding an Associate or Bachelor degree (72.2%), but more than half of the participants fell in a lower income bracket (e.g., \$0 - \$50,000/year = 54.5%). Taken together, our sample was comprised of predominantly White, well-educated, and lower income individuals; however, our sample was relatively representative of the United States population. According to the 2010 census, 49.2% of the population identified as male, 72.4% identified as White, and the median age was 37.2 years old (U.S. Census Bureau). The survey’s availability was limited to the United States to ensure results were applicable to and relatively representative of United States residents, because we expected that the trait response to emotion dimensional structure could be different depending on one’s country of origin. See Table 1 for a full report of descriptive statistics.

Table 1. *Descriptive Statistics*

	Sample Mean (SD) or %	Census Median or %
Age	38.84 (11.8)	36
Gender		
Cis Male	52.1	49.2
Cis Female	45.1	50.9
Non-binary	0.7	-
Other	1.8	-
Prefer not to say	0.4	-
Income		
0-\$9,999	2.1	21.3
\$10-\$19,999	7.4	14.5
\$20-\$29,999	13.0	12.8
\$30-\$39,999	15.5	11.1
\$40-\$49,999	16.5	8.4
\$50-\$59,999	10.9	7.1
\$60-\$69,999	10.6	5.3
\$70-\$79,999	4.2	4.0
\$80-\$89,999	4.6	3.0
\$90-\$99,999	4.6	2.2
\$100k or more	10.6	10.3
Education		
Less than high school	0.7	10.6
High school or equivalent (e.g., GED)	16.5	28.3
Some college but no degree	18.3	18.0
Associate Degree	14.8	9.8
Bachelor Degree	39.1	21.3

Table 1 (continued).

Graduate Degree	10.6	12.0
Ethnicity		
White	82.4	72.4
Black	7.0	12.6
Hispanic	1.1	16.3
American Indian or Alaskan Native	0.4	0.9
Asian	3.9	4.8
Two or more races	4.6	2.9
Other	0.7	6.2

Procedure

All procedures were approved by the Institutional Review Board (IRB) at the University of Kentucky prior to the start of data collection. Participants were recruited through a survey link posted on the TurkPrime website. On the first page of the survey, participants read the consent form that included information about the tasks for the study, confidentiality, and compensation. They then gave consent to participate. Measures were administered via a battery of online surveys that were made available on TurkPrime.

Measures

Demographics.

Participants provided demographic information including age, gender, SES, education, and race/ethnicity.

Early life experiences.

Early life experiences were assessed with the Risky Families Questionnaire (Felitti et al., 1998; Taylor, Lerner, Sage, Lehman, & Seeman., 2004). The Risky Families Questionnaire is a 13-item measure (10 items +3 filler items) that uses a 5-point Likert scale ranging from 1 (not at all) to 5 (very often) to assess the degree of risk of physical, mental, and emotional distress experienced by participants in their homes during childhood and adolescence (e.g., “Would you say the household you grew up in was chaotic and disorganized?” and “Would you say you were neglected while you were growing up, left on your own to fend for yourself?”). In the current sample, the scale had adequate internal consistency (e.g., $\omega = .74$).

Trait Responses to Emotion.

Participants completed a battery of trait response to emotion measures.

Control.

Urgency was assessed with the Positive Urgency (PUR; Cyders et al., 2007) and Negative Urgency (NUR) scales of the revised version of the UPPS Impulsive Behavior Scale (UPPS-R; Whiteside & Lynam, 2001). The PUR is a 14-item measure that uses a 4-point Likert-type scale ranging from 1 (agree strongly) to 4 (disagree strongly) to assess urgency when experiencing positive emotions (e.g., “When I get really happy about something, I tend to do things that can have bad consequences” and “I tend to act without thinking when I am really excited”). The scale had good internal consistency ($\omega = .95$). The NUR is a 12-item subscale of the UPPS-R that also uses a 4-point Likert-type scale ranging from 1 (agree strongly) to 4 (disagree strongly) to assess urgency when

experiencing negative emotions (e.g., “When I feel bad, I will often do things I later regret in order to make myself feel better now” and “When I am upset I often act without thinking”). The scale had good internal consistency ($\omega = .91$).

Approach and Avoidance.

Approach- and avoidance-related traits was assessed with the Need for Affect Scale (Maio & Esses, 2001), the Acceptance and Action Questionnaire-II (Bond et al., 2011), the Acceptance of Emotions Scale (Weihs, Enright, & Simmens, 2008), and the Emotional Approach Coping Scale (Stanton et al., 2000).

The Need for Affect Scale is a 26-item measure that uses a 7-point response scale ranging from -3 (strongly disagree) to 3 (strongly agree) with 13 items that assess motivation to approach emotions (e.g., “It is important for me to be in touch with my feelings” and “I think that it is important to explore my feelings”) and 13 items to assess the motivation to avoid emotions (e.g., “I do not know how to handle my emotions, so I avoid them” and “I find strong emotions overwhelming and therefore try to avoid them”). Both subscales had good internal consistency ($\omega = .87$ for motivation to approach emotions and $\omega = .93$ for motivation to avoid emotions).

The Acceptance and Action Questionnaire-II (AAQ-II) is a 7-item measure that uses a 7-point response scale ranging from 1 (never true) to 7 (always true) that assesses psychological inflexibility or experiential avoidance (e.g., “My painful experiences and memories make it difficult for me to live a life that I would value” and “I’m afraid of my

feelings”). It is a one-factor measure that is scored by summing the 7 items; higher scores equal more psychological inflexibility. The AAQ-II had good internal consistency ($\omega = .95$).

The Acceptance of Emotions Scale (AE) is a 13-item measure where responses are based on the percentage of time that each statement is true in increments of 10, ranging from 0 (never/not at all) to 100 (always/perfectly). It assesses the extent that individuals are accepting of their feelings (e.g., “I naturally and easily attend to my feelings”), and the total score is the mean of the ratings on the 13 items, where higher scores indicate more emotional acceptance. The AE scale had good internal consistency ($\omega = .95$).

Emotion Approach Coping (EAC) was assessed with the dispositional version of the Emotional Approach Coping Scale (Stanton et al., 2000), which measures people’s characteristic ways of managing emotions in stressful encounters. The Emotional Approach Coping Scale is an 8-item measure that uses a 4-point response option ranging from 1 (I usually don’t do this at all) to 4 (I usually do this a lot) and measures two domains for coping through emotional approach: emotional processing (e.g., “I take time to figure out what I’m really feeling”) and emotional expression (e.g., “I let my feelings come out freely”). The scale had good internal consistency for both subscales ($\omega = .87$ for the emotional processing subscale and $\omega = .92$ for the emotional expression subscale).

Expression.

Emotion expression was assessed with the Berkeley Expressivity Questionnaire (Gross & John, 1998), the Emotional Expressiveness Questionnaire (King & Emmons,

1990), the Emotion Regulation Questionnaire (Gross & John, 2003), and the Affective Style Questionnaire (Hofmann & Kashdan, 2010).

The Berkeley Expressivity Questionnaire is a 16-item measure that uses a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) that assesses three facets of emotional expressivity: negative expressivity (e.g., “Whenever I feel negative emotions, people can easily see exactly what I am feeling”), positive expressivity (e.g., “When I’m happy, my feelings show”), and impulse strength (e.g., “I experience my emotions very strongly”). The scale had good internal consistency for all subscales ($\omega = .83$ for the negative expressivity subscale, $\omega = .84$ for the positive expressivity subscale, and $\omega = .83$ for the impulse strength subscale).

The Emotional Expressiveness Questionnaire is a 16-item measure that uses a 7-point scale ranging from 1 (does not agree at all) to 7 (strongly agrees) that assesses the expression of positive (e.g., “I laugh a lot”) and negative emotions (e.g., “When I am angry people around me usually know”) and intimacy (e.g., “I often tell people that I love them”). High scores on the EEQ indicate higher emotion expression. The scale had adequate internal consistency for all subscales ($\omega = .79$ for the positive emotions subscale, $\omega = .72$ for the negative emotions subscale, and $\omega = .73$ for the intimacy subscale).

The expressive suppression subscale of the Emotion Regulation Questionnaire is a 4-item measure that uses a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) that assesses individual differences in expressive suppression (e.g., “I keep my emotions to myself”). The expressive suppression subscale had good internal consistency ($\omega = .88$).

The Affective Style Questionnaire is a 20-item measure that uses a 5-point scale ranging from 1 (not true of me at all) to 5 (extremely true of me) that assesses individual differences in emotion regulation techniques. The scale includes three subscales: concealing (e.g., “People usually can’t tell how I am feeling inside”), adjusting (e.g., “I have my emotions well under control”), and tolerating (e.g., “I can tolerate having strong emotions”). The scale had good internal consistency for two subscales ($\omega = .90$ for the concealing subscale and $\omega = .91$ for the adjusting subscale) and acceptable internal consistency for the tolerating subscale ($\omega = .78$).

Alexithymia.

Alexithymia was assessed with the Toronto Alexithymia Scale-II (Bagby, Parker, & Taylor, 1993). The Toronto Alexithymia Scale-II (TAS-20) is a 20-item measure that uses a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) that assesses alexithymia. The scale includes three subscales: difficulty describing feelings (e.g., “It is difficult for me to find the right words for my feelings”), difficulty identifying feeling (e.g., “I am often confused about what emotion I am feeling”), and externally-oriented thinking (e.g., “I prefer to analyze problems rather than just to describe them”). The scale had good internal consistency for two subscales ($\omega = .86$ for the difficulty describing feelings subscale and $\omega = .90$ for the difficulty identifying feelings subscale), and adequate internal consistency for the externally oriented thinking subscale ($\omega = .70$).

Affectivity.

Affectivity was assessed with the modified Differential Emotions Scale (Fredrickson, Tugade, Waugh, & Larkin, 2003). The modified Differential Emotions Scale (mDES) is a 20-item measure that uses a 5-point Likert scale ranging from 0 (not at

all) to 4 (extremely) to assess the degree and frequency of positive and negative emotions. The scale includes two subscales: positive emotions (e.g., “What is the most amused, fun-loving, or silly you felt?”) and negative emotions (e.g., “What is the most angry, irritated, or annoyed you felt?”). The scale had good internal consistency for both subscales ($\omega = .93$ for the positive emotions subscale and $\omega = .96$ for the negative emotions subscale).

Anchoring Scales.

In order to assess whether our proposed dimensions represent approach/avoidance and control/dyscontrol, we used the BIS/BAS Scale (Carver & White, 2013) and the Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004) as anchoring scales.

The BIS/BAS scale is a 24-item measure that uses a 4-point scale ranging from 1 (very true for me) to 4 (very false for me) to measure two motivational systems, the behavioral inhibition system (BIS) and the behavioral activation system (BAS). The BIS corresponds to motivation to avoid aversive outcomes (e.g., “Criticism or scolding hurts me quite a bit”), and the BAS corresponds to motivation to approach goal-oriented outcomes and has three subscales: drive (e.g., “I go out of my way to get things I want”), fun-seeking (e.g., “I’m always willing to try something new if I think it will be fun”), and reward-responsiveness (e.g., “When I’m doing well at something, I love to keep at it”). All three of the BAS subscales had good internal consistency ($\omega = .87$ for the drive subscale, $\omega = .80$ for the fun-seeking subscale, and $\omega = .79$ for the reward-responsiveness subscale). The BIS subscale also had good internal consistency ($\omega = .90$).

The Brief Self-Control Scale is a 13-item measure that uses a 5-point scale ranging from 1 (Not at all like me) to 5 (very much like me) to assess dispositional self-

regulatory behaviors (e.g., “I am good at resisting temptation”). The scale had adequate internal consistency ($\omega = .78$).

Analytic Approach

Sample size was set *a priori* to accurately estimate the correlations in our model to achieve statistical significance. The stability of correlations is impacted by sample size and the reliability of the measures utilized in a study (Schönbrodt & Perugini, 2013). Because the study employed reliable measures, target sample size was 250. This sample size would yield stable correlation estimates (i.e., fluctuations associated with small changes in the sample), allowing for accurate estimation of “distance” among constructs (i.e., how similar or dissimilar constructs are to each other). Distributions of all demographic and trait responses to emotion measures (e.g., means, standard deviations, skew, kurtosis, minima, maxima, ranges, and frequency distributions) were examined. Nonparametric correlations were used as the basis for the multidimensional scaling (MDS) because Positive Urgency was negatively skewed.

Missing data were handled on a case-by-case basis. For instance, if a participant was missing data for the majority of items on a measure (e.g., if $\omega < .70$ for the measure and 50% or more of the items were missing; Schafer & Graham, 2002), their total score for that measure was not included in analyses; however, if they had completed all items on other measures, their scores on those measures were included in subsequent analyses. If a participant had missing data for items across most measures or across all measures (e.g., 75% of measures are incomplete), their data were not used in analyses. Of the 415 initial participants, 131 participants had missing data and were not included in analyses. From the 284 participants included in analyses, missing data rules resulted in 3 missing

values for Negative Urgency, and 1 missing value for Positive Urgency, the Toronto Alexithymia II Scale, and the BIS/BAS. There was also 1 nonresponse for age.

Participants with genders other than male or female ($N = 8$) were excluded from correlations with gender and from regression analyses because gender was treated as an explanatory continuous variable (e.g., dichotomous variable), leaving an analytic sample size of 276 for correlations with gender and regression analyses.

1. Hypothesis 1 stated that approach, avoidance, and control would characterize the factor structure of trait responses to emotion. The first step converted scale scores to z scores. A general propensity to response to emotion was assessed by examining item-total correlations and the mean correlation among the measures. The second step investigated qualitative differences in trait responses to emotion using MDS. The multidimensional model was constructed using ALSCAL in SPSS (Version 25). Distances between emotion trait response measures was calculated as 1 minus the correlation between the two measures and treated as interval data. There are 21 total measures (including subscales), allowing up to 5-dimensional models (Kruskal & Wish, 1978). Model fit was assessed by stress values, a measure comparable to the square root of the residual sum of squares when the model is used to estimate the initial distance matrix. Stress values that are close to zero indicate good model fit. How many dimensions best represented the model for trait responses to emotion was based on whether stress continued to decrease by at least .05 with the addition of another dimension. If the stress value no longer decreased by at least .05 with the addition of dimensions past n , then we could determine that n dimensions best represented the model for trait responses

to emotion. Based on Kruskal's guidelines, good model fit was indicated by stress $\leq .05$ (Kruskal, 1964).

2. Hypothesis 2 stated that individuals who are younger and/or are female will utilize more approach trait emotion responses; in contrast, individuals who are older and/or are male will utilize more avoidant trait emotion responses. Additionally, individuals who are older and/or are female will utilize more control trait emotion responses than individuals who are younger and/or are male. The relationships among these demographic variables and the dimension scores were investigated using both zero-order correlations and multiple regression models. Dimension scores were calculated using the following equation: $\sum_{i=1}^{21} d_{ij}(x_i)$, where d = the dimension weight of the scale for the i^{th} individual, j = the dimension, and x_i represents the z-score for the scale for the individual. In multiple regression models, demographics served as explanatory variables, and the dimension score was the outcome variable:

$$\widehat{\text{dimension score}} = \beta_0 + \beta_1 X_{(\text{age})} + \beta_2 X_{(\text{gender})} + e$$

where β_0 = the predicted value of the dimension score when all demographic variables are zero, and β_1 = the regression coefficient (or slope) for an independent variable.

3. There is less evidence for the effects of early life experiences on approach and control trait emotion responses; exploratory analyses of the relationships between this variable and approach and control trait emotion responses were conducted. The relationships among this demographic variable and the dimension scores were investigated using both zero-order correlations and regression models.

$$\widehat{dimension\ score} = \beta_0 + \beta_1 X_{(early\ life\ experiences)} + e$$

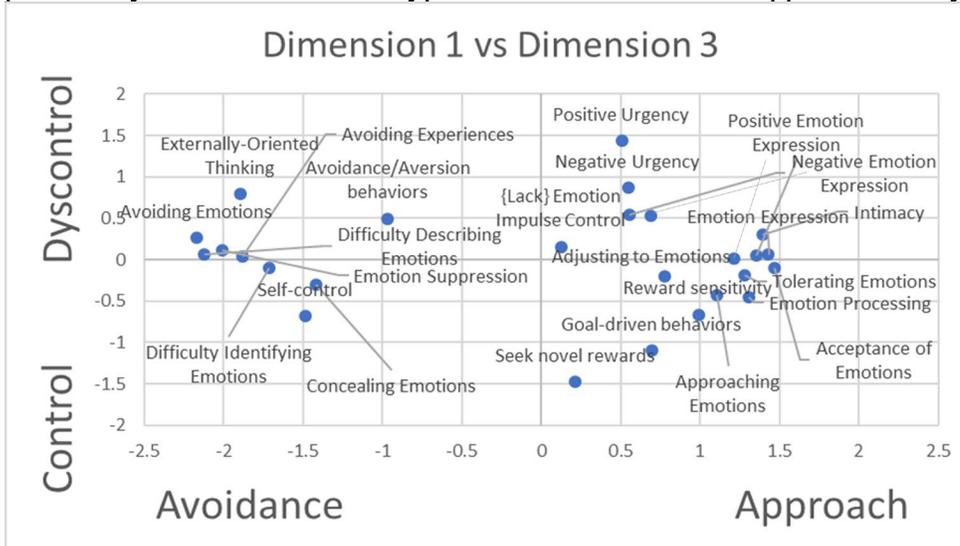
Alpha was set at .05. The Benjamini-Hochberg procedure, a sequential approach that is equivalent to Bonferroni correction but has been demonstrated to yield greater power (Benjamini and Hochberg, 1995; Thissen, Steinberg, Kuang, 2002), was applied to account for performing multiple tests on each proposed trait response to emotion dimension to reduce our Type I error rate.

RESULTS

Hypothesis 1

Kruskal's stress values for two- to four-dimension solutions were .13, .08, and .06, respectively. Because higher dimension models did not substantially reduce stress, a three-dimensional solution was selected. Although Kruskal's guidelines state a stress value less than .10 and greater than .05 indicates "fair fit", a Monte Carlo study characterized stress of .051 as "low random error" and .190 as "moderate random error" for this design (MacCallum, 1981). Taken together, the final stress value of .08 for a three-dimensional solution therefore represents fair fit and reasonably low random error. The three dimensions that characterized the dimensional structure of trait responses to emotion were approach, dyscontrol, and emotion engagement. Figure 1 shows the two hypothesized dimensions: Dimension 1 (Approach) vs Dimension 3 (Dyscontrol).

Figure 1. Multidimensional scaling of trait responses to emotion and anchoring personality measures with the hypothesized dimensions of approach and dyscontrol.



For Dimension 1, measures reflecting emotional approach, such as emotion acceptance, emotion expression (particularly for positive emotions), and emotion processing received the highest scores, and those reflecting emotional avoidance, such as avoiding emotions, alexithymia traits such as difficulty describing and identifying emotions, and emotion suppression received the lowest scores. The approach dimension had the constructs of emotion acceptance (1.47), emotion expression (1.43), and intimacy (1.40) at one extreme, and avoiding emotions (-2.17), difficulty describing emotions (-2.12), and emotion suppression (-2.01) at the other.

For Dimension 3, measures reflecting dyscontrol when dealing with emotions, such as positive and negative urgency, emotion expression (particularly for negative emotions), and alexithymia traits such as externally-oriented thinking received the highest scores, and those reflecting control tendencies when dealing with emotions, such as engaging in goal-driven behaviors (e.g., acting in line with one’s goals), self-control, and tolerating emotions received the lowest scores. The dyscontrol dimension had the constructs of positive urgency (1.43), negative urgency (.86), and externally-oriented

thinking (.79) at one extreme, and seeking novel rewards (-1.47), goal-driven behaviors (-1.10), and self-control (-.69) at the other.

Dimension 2 identified a third, unhypothesized dimension, emotion engagement. Measures reflecting emotion engagement, such as positive and negative emotion expression, impulsive emotion expression, and approach tendencies received the highest scores, and those reflecting emotion disengagement, such as concealing emotions, negative and positive urgency, and emotion suppression tendencies received the lowest scores. The emotion engagement dimension had the constructs of impulsive emotion expression (1.48), avoidance/aversion behaviors (1.35), and negative emotion expression (1.30) at one extreme, and negative urgency (-1.78), adjusting to emotions (-1.66), and concealing emotions (-1.58) at the other.

Descriptive Statistics

Table 2 contains the correlations among study variables. The three dimensions that characterized the structure of trait responses to emotion (e.g., approach, engagement, and dyscontrol) should be orthogonal to each other; however, the approach and engagement dimensions were negatively correlated, with higher approach correlating with lower engagement ($r = -.22, p < .01$). The correlation between the approach and engagement dimension may have been due to missing data not being “missing completely at random” (MCAR), which can create spurious correlations. After imputing missing data based on the trait responses to emotion scores using expectation-maximization, the correlation was sufficiently small that the dimensions could be considered independent of each other ($r = .12, p < .05$).

Age and gender were significantly correlated, with older age correlating with female gender ($r = .23, p < .01$). There were statistically significant correlations between higher engagement and higher dyscontrol and female gender ($r = .28, p < .001$ for engagement, $r = .22, p < .001$ for dyscontrol) and higher dyscontrol and older age ($r = .38, p < .001$). Age and approach were significantly correlated, with higher approach correlating with older age ($r = .13, p < .05$). Gender was not significantly correlated with approach. There were statistically significant correlations between lower approach and higher engagement and risky early life experiences ($r = -.22, p < .001$ for approach, $r = .21, p < .001$ for engagement). Riskier early life experiences were not significantly correlated with the dyscontrol dimension.

Table 2. Correlations of Study Variables ($N=284$; $N=276$ for correlations with gender)

	2	3	4	5	6
1. Approach	.127*	-.007	.132*	.058	-.215**
2. Comfort		-.052	.060	.278**	.209**
3. Dyscontrol			.383**	.220**	-.067
4. Age				.231**	.042
5. Gender (female = 1)					.101
6. Risky Early Life Experience					

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

Hypothesis 2

After determining that multicollinearity was not present between age and gender (VIF = 1.032), the variables were entered together in the regression model. Age was expected to correlate negatively with the approach dimension (e.g., older participants

would have lower approach) and to correlate positively with the control dimension.

Female participants were expected to have higher approach and higher control.

For the approach dimension, age and gender accounted for 2% of the variance in approach ($F(2, 272) = 2.53, p = .081, R^2_{\text{Adjusted}} = .011$). Contrary to Hypothesis 2, older age was associated with more emotional approach ($\beta = .125, 95\% \text{ CI } [.004, .247], p = .043$). Female gender was associated with more emotional approach, but this relationship was not statistically significant ($\beta = .029, 95\% \text{ CI } [-.091, .149], p = .635$).

For the engagement dimension, age and gender accounted for 8% of the variance in emotion engagement ($F(2, 272) = 11.96, p < .001, R^2_{\text{Adjusted}} = .074$). Age did not significantly predict participants' emotion engagement ($\beta = -.006, 95\% \text{ CI } [-.140, .126], p = .921$). Female gender was associated with more emotion engagement ($\beta = .286, 95\% \text{ CI } [.168, .404], p < .001$).

Finally, for the dyscontrol dimension, age and gender accounted for 1% of the variance in dyscontrol scores ($F(2, 272) = 26.87, p < .001, R^2_{\text{Adjusted}} = .159$). Contrary to Hypothesis 2, older age was associated with more dyscontrol ($\beta = .351, 95\% \text{ CI } [.239, .463], p < .001$). Also contrary to the hypothesis, female gender was associated with more dyscontrol ($\beta = .138, 95\% \text{ CI } [.026, .250], p = .016$).

Hypothesis 3

For the approach dimension, early life experiences accounted for 5% of the variance in approach ($F(1, 274) = 13.25, p < .001, R^2_{\text{Adjusted}} = .04$). Participants with less risky early life experiences had higher approach than participants with riskier early life experiences ($\beta = -.215, 95\% \text{ CI } [-.331, -.099], p < .001$).

For the engagement dimension, early life experiences accounted for 4% of the variance in engagement ($F(1, 274) = 12.57, p < .001, R^2_{\text{Adjusted}} = .04$). Riskier early life experiences were associated with higher emotion engagement ($\beta = .209, 95\% \text{ CI } [.093, .325], p < .001$).

For the dyscontrol dimension, early life experiences accounted for .005% of the variance in dyscontrol scores ($F(1, 274) = 1.25, p = .27, R^2_{\text{Adjusted}} = .001$). Early life experiences were not significantly associated with dyscontrol ($\beta = -.067, 95\% \text{ CI } [-.186, .051], p = .27$).

To reduce our Type I error rate, the Benjamini-Hochberg procedure was applied to account for performing multiple tests on each proposed trait response to emotion dimension. The p-values for the approach and engagement dimensions remained statistically significant ($p < .001$) and remained statistically non-significant for dyscontrol ($p = .27$).

Adjusting for age and gender did not substantively change the results for the relationship between early life experiences and the approach and comfort dimensions. Adjusting for age and gender increased the magnitude of the relationship between riskier early life experiences and dyscontrol, but not to the point of statistical significance ($\beta = -.097, 95\% \text{ CI } [-.206, .012], p = .081$).

DISCUSSION

Driven by the theoretical relationships among trait responses to emotion, this study aimed to establish and explore the empirical relationships of these trait responses to emotion to each other by developing a multidimensional model from a large, diverse sample. A 3-dimensional model best represented the structure of trait responses to

emotion. Consistent with our hypothesis, approach, avoidance, and control (labeled “dyscontrol” in the Results, as the positive pole of the dimension indicated dyscontrol) characterized the dimensional structure of trait responses to emotion. Further, a third dimension, emotion engagement, emerged.

Our first hypothesized dimension was approach-avoidance, which captured people’s tendency to approach their emotions or avoid experiencing emotions. Participants who were high in approach reported emotion expression (particularly positive emotions) and emotion acceptance and processing. On the opposite pole, participants who were high in avoidance reported emotion suppression and alexithymic traits, such as difficulty identifying emotions. We hypothesized that older participants would be low in approach, and female participants would be high in approach; however, older participants were high in approach, and gender was not associated with approach. It appears as if increasing age is associated with more emotion approach through middle adulthood, whereas older adults may begin to avoid emotions more to conserve resources (Carstensen & Charles, 1998; Carstensen, Isaacowitz, & Charles, 1999). Additionally, men and women were equally high in emotional approach. This finding may be reflective of society’s shifting gender ideals regarding “appropriate” emotions. It may be more acceptable for men to express emotions other than anger, as it is for women. Finally, those who had less risky early life experiences reported higher approach. Positive early life experiences mediated by quality parental care can create safer environments for children to explore and express their emotions (Francis, Diorio, Liu, & Meaney, 1999; Liu et al., 1997).

Our second hypothesized dimension was control-dyscontrol, which captured people's tendency to act in controlled ways that align with their long-term interests and goals when experiencing strong emotions or to react impulsively when experiencing strong emotions. Participants who were high in control reported self-control and goal-driven behaviors and emotion tolerance. On the opposite pole, participants who were high in dyscontrol reported positive and negative urgency, emotion expression (particularly of negative emotions), and alexithymic traits, such as externally-oriented thinking. We hypothesized that older as well as female participants would be high in control; however, older as well as female participants were low in control. Contrary to our hypothesis and the literature, as one ages into middle adulthood, one is more likely to react impulsively. This finding may reflect a case in which younger generations need to suppress emotion expression and impulsivity in order to accomplish career and social goals. Additionally, women reported higher dyscontrol in response to emotion. Although men may be equally prone to express their emotions, cultural expectations about controlling one's response to emotional experience may have resulted in this gender difference. There was not a statistically significant relationship between dyscontrol and early life experiences, even though those who have riskier early life experiences are more likely to engage in dyscontrolled trait response to emotion (Andersen et al., 1999; D'Andrea et al., 2012; Thompson, 2011).

The interstitial space between our hypothesized dimensions (e.g., approach-avoidance and control-dyscontrol) suggests that those who are high in avoidance and control are more likely to report alexithymia traits (e.g., difficulty describing and identifying emotions) and emotion suppression; in contrast, those who are high in

avoidance and dyscontrol are more likely to report emotional and behavioral avoidance of their emotions. Emotion control may be detrimental at times when ineffective emotion regulation strategies are utilized (e.g., emotion suppression, externally oriented thinking). These ineffective emotion regulation strategies may help to lower distress in the moment but result in an inability to effectively manage emotions in the long-term.

A third dimension, emotion engagement, captured people's engagement with or disengagement from emotions. Participants who had high emotion engagement reported positive and negative emotion expression, impulsive emotion expression, and approach tendencies. Participants who were high in disengagement reported emotion suppression and concealment and both positive and negative urgency. Urgency can represent emotion disengagement because one reacts impulsively to avoid feeling strong emotions without resolving the emotions or their cause. Age was not associated with engagement; however, there was a significant positive relationship between gender and engagement. Female participants were more likely to report emotion engagement, reflective of gender socialization practices where women are expected and encouraged to engage with and explore their emotions more than are men (Brody & Hall, 1993; Jansz, 2000; Shields, 2002). Additionally, there was a significant positive relationship between riskier early life experiences and emotion engagement. Participants who reported riskier early life experiences had higher emotion engagement.

Our findings may suggest a resilience effect, much like Chen & Miller's (2012) "Shift-and-Persist" model, such that those who are exposed to harsher experiences early in life or have lived in more emotionally volatile environments may adapt to, and thus be more comfortable with, expressing strong emotions (Chen & Miller, 2012). For instance,

in our data, participants who reported riskier early life experiences reported less positive and negative urgency. Additionally, engagement may not always be positive, such as engaging in impulsive emotion expression and negative emotions. In riskier families, there may be excessive engagement with emotion, which predisposes children to be more likely to engage with all emotions, regardless of their social and relational effects. The latter explanation is more likely in this sample, as riskier families were associated with more avoidance ($r = .316, p < .001$) and impulsive expression ($r = .163, p = .007$) and less intimacy expression ($r = -.143, p = .017$).

This study was not without limitations. These data were cross-sectional, and longitudinal designs could reveal how trait responses to emotion change over time. Study demographics were mostly representative of United States demographics, which indicates that our results are likely to be generalizable to United States adults; however, there was an underrepresentation of Hispanics and an overrepresentation of middle-class Americans, so the dimensional structure may not be wholly representative of other ethnic and socioeconomic groups in the United States. Finally, this study involved only self-report measures. Objective measures (e.g., observation) and informant data could provide an alternative perspective on trait response to emotion.

The findings imply directions for future research in developmental, social, clinical, and health psychology. Determining which aspects of early life experiences influence the development of trait responses to emotion would help with identifying points of intervention early in child development. Socioeconomic context, which provides a picture of one's environment by combining the environmental, social, and structural components of one's community, could provide further information about

potential influences on the development of trait responses to emotion. Further, the sample was predominantly White, middle-class, and educated. Examining other ethnic and socioeconomic samples would determine if the dimensional structure observed in this study is characteristic in other ethnic and socioeconomic groups. The effects of the three dimensions in trait responses to emotion on physical health would help consolidate the literature on how individual constructs (e.g., emotion expression, alexithymia, emotional approach coping) relate to health. Finally, the empirical relationships among trait responses to emotion and dimension scores could help clinical practice by identifying general targets (i.e., control, engagement, approach) in the adoption of healthier and more prosocial trait responses to emotion.

Individual constructs representing different trait responses to emotion have been associated with psychological and physical health outcomes (Segerstrom & Smith, 2019). Mapping the relationships among trait responses to emotion helps to further establish their nomological net and to provide a more parsimonious way to characterize their relationships and underlying qualities. The relationships of trait responses to emotion to demographic characteristics can help to identify possible protective and risk factors. Future research using this dimensional map will clarify how trait responses to emotion affect psychological and physical health.

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VITA

Anita Michelle Adams

Education

B.A. - North Carolina State University

May 2016

Majors: Psychology and English-Creative Writing

Minors: Cognitive Science, Spanish, and Health, Human Values, and Vaccinations

Associates in Arts – Wake Technical Community College

May 2012

Professional Positions Held

Orofacial Pain Clinic Psychology Resident

July 2020 - Present

University of Kentucky

Supervisor: Ian Boggero, PhD & Tess Smith, MS

Jesse G. Harris Jr. Psychological Services Center Therapist

Sept 2019 – Present

University of Kentucky

Supervisor: David Susman, PhD

Thought, Stress, and Immunity Study Research Assistant

August 2019 – Present

University of Kentucky

Supervisor: Suzanne Segerstrom, PhD, MPH & Mary Beth McGavran, PhD

University of Kentucky Counseling Center Practicum

August 2019 – March 2020

University of Kentucky

Supervisor: Amber Carter, PsyD & Olivia Szlachta, MA

Research Study Coordinator

January 2017 – June 2018

The University of North Carolina at Chapel Hill – Psychiatry Department

Supervisors: Crystal Schiller, PhD & David Rubinow, MD

Autism Support Specialist

July 2016 – March 2018

The Autism Society of North Carolina

Supervisor: Nina Sherrod

Psychology Intern

May 2016 – November 2016

Longleaf Neuromedical Center

Supervisor: Brian Spillman, PhD & Daniel Schaffer, BS

Teaching Assistant August 2014 – December 2014
North Carolina State University Psychology Department
Supervisor: John Begeny, PhD

Research Assistant August 2013 – December 2016
Family, Affect, Beliefs & Behaviors Lab
Supervisor: Amy Halberstadt, PhD

Research Assistant January 2013 – May 2016
Adult Cognition & Emotion Lab
Supervisor: Daniel Grünh, PhD

Research Assistant May 2013 – December 2013
Memory and Narrative Development Lab
Supervisor: Lynn Baker-Ward, PhD

Scholastic and Professional Honors

Valedictorian of NC State’s Class of 2016 May 2016

Outstanding Academic Achievement in the Psychology Department May 2016

NC State Spring Symposium Best Presentation in Psychology April 2016

University-Endorsed Rhodes Fellowship Nominee August 2015

University-Endorsed Marshall Fellowship Nominee August 2015

IMSD Highest GPA Recipient May 2013 – May 2016

University Honors Program August 2013 – May 2016

Dean’s List August 2012 – May 2016

Professional Publications

National Conferences

Adams, A. M., Smith, G. T., Widiger, T. A., & Segerstrom, S. C. (2020, March).
Response to emotional experience: A multidimensional scaling study in diverse adults. Poster to be given at “Achieving Health Equity: Opportunities for Psychosomatic Medicine” the 78th Annual Meeting of the American Psychosomatic Society, Long Beach, CA. Conference canceled.

- Leontyeva, A., Chentsova-Dutton, Y., Halberstadt, A., & **Adams, A.** (2019, March). *Are emotions costly in a harsh world?* Poster presented at preconference session at the Society for Affective Science, Boston, MA.
- Leontyeva, A., Chenstova-Dutton, Y., Halberstadt, A., **Adams, A.**, & Rinker, D. (2019, March). *Negative emotions in Russian and American children's books.* Poster session presented at the Society for Affective Science, Boston, MA.
- Leontyeva A., Chentsova-Dutton, Y., Halberstadt, A., **Adams, A.**, & Rinker D. (2018, March). *Emotions in children's books across two cultures.* Poster session presented at the Advances of Cultural Psychology of the Society of Personality and Social Psychology, Atlanta, GA.
- Oertwig, D., Riquelme-Mella, E. H., **Adams, A. M.**, & Halberstadt, A.G. (2017, April). *Beliefs about emotion regulation among Mapuche and non-Mapuche Chilean parents and teachers.* In Halberstadt, A.G. & Friedlmeier, W. (Chairs). *Socialization of emotion regulation: Goals and practices around the world.* Symposium presented at the Society for Research in Child Development, Austin, TX.
- Adams, A. M.**, Halberstadt, A. G., & Chentsova, Y. (2015, November). "*Dzek and Jill learn what to feel: Emotions in picture books across Russian and American culture.* Poster presented at the Annual Biomedical Research Conference for Minority Students, Seattle, WA.
- Bohanek, J. G., **Adams, A. M.**, Leon, E. D., & Halberstadt, A. G. (2015, March). *Mother-child reminiscing and children's emotion understanding.* Poster presented at the Society for Research in Child Development Conference, Philadelphia, PA.
- Adams, A. M.**, Castro, V. L., & Halberstadt, A. G. (2014, November). *And they all lived happily ever after": Emotions, emotion regulation, and "happy endings" in American children's books.* Poster presented at the Annual Biomedical Research Conference for Minority Students, San Antonio, TX.
- Rogers, M. L., MacCormack, J. K., Castro, V. L., **Adams, A. M.**, & Halberstadt, A. G. (2014, April). *Mother's maladaptive emotion regulation strategies mediate between maternal emotion beliefs & children's socioemotional skills.* Poster presented at the Society for Affective Science Conference, Bethesda, MD.

Regional and Local Conferences

- Sheehan, M., Tansey, S., Mayo, J., **Adams, A. M.**, Van Valkenburgh, B., & Richards, J. (2017, October). *Monitoring and improving the safety and efficiency of admissions to UNC inpatient psychiatry units from the ED.* Poster presented at the 2017 Quality Expo for the University of North Carolina Hospital, Chapel Hill, NC.
- Adams, A. M.**, Littlejohn, T., & Lucas, S. (2016, April). *"Dzek and Jill learn what to feel": Emotions in picture books across Russian and American culture.* Poster

presented at the North Carolina State University Spring Research Symposium, Raleigh, NC.

Adams, A. M., & Shepherd, M. (2015, April). *Sleep inefficiency in relation to personality and emotional reactivity*. Presented at the Carolina Psychology Conference, Raleigh, NC.

Adams, A. M., & Halberstadt, A. G. (2014, July). “*Everything is going to be okay, Billy!*”: *Emotions in American children’s books*. Poster presented at the North Carolina State University Summer Research Symposium, Raleigh, NC.

Adams, A. M., Brochu, H., Griffin, J., Leon, E. D., & Lozada, F. (2014, April). *Mothers’ coping strategy goals for their 3rd grade children: A mixed methods approach*. Poster presented at the Southwest Psychological Association Conference, San Antonio, TX.