

MALADAPTIVE EMOTIONAL SCHEMAS AND PSYCHOEMOTIONAL FUNCTIONING:
INTRODUCTION AND EVALUATION OF AN INTEGRATED MODEL ACROSS TWO
INDEPENDENT SAMPLES

Abstract

Background: Recent advancements in emotion theory propose that emotional schemas – individualized conceptualizations and beliefs about emotions – serve a fundamental function in guiding psychoemotional processes. To critically assess the validity of this suggestion, the current research proposed and evaluated an integrative model of psychoemotional functioning.

Method: Two studies were completed using a combination of behavioral, performance-based, and self-report measures of maladaptive emotional schemas and psychoemotional functioning.

Results: Results supported the model and suggested complex interrelations between maladaptive emotional schemas, emotion-processing deficits, avoidant coping, emotion-regulation ineffectiveness, and behavioral dysregulation, with emotional schemas playing a key role in guiding psychoemotional experience and functioning. **Conclusions:** Given the centrality of beliefs about emotion and psychoemotional functioning in empirically supported therapies, the proposed model may inform future research on mechanisms of change in these treatments.

Keywords: emotional schemas, emotion regulation, behavioral regulation, avoidant coping, emotion processing

Recent years have seen a rise in the popularity of third-wave behavior therapies. Third-wave behavior therapies (e.g., Dialectical Behavior Therapy [DBT]; Functional Analytic Psychotherapy [FAP], Acceptance and Commitment Therapy [ACT], etc.) are characterized by experiential treatment strategies that target secondary reactions to private emotional experiences (e.g., mindfulness, acceptance, etc.; Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004; Kahl, Winter, & Schweiger, 2012). With some variation, these treatments theorize that *the way an individual relates to their internal, private experiences contributes to these secondary reactions*, thereby shaping psychoemotional functioning (e.g., emotion processing, emotion regulation, behavior regulation, etc.). For example, DBT's biosocial theory suggests emotion and behavior dysregulation stem in part from internalization of invalidating emotional experiences, which lead individuals who view their emotions as wrong, unacceptable, or intolerable (Linehan, 1993). Similarly, ACT suggests emotional distress stems in part from perception of private experiences as in need of avoidance (Hayes, Strosahl, & Wilson, 1999).

Consistent with these suggestions, growing research suggests expectations or beliefs about emotion (i.e., emotional schemas) are associated with various forms of psychopathology (e.g., depression, anxiety, etc.; Leahy, Tirsch, & Melwani, 2012; Tirsch, Leahy, Silberstein, & Melwani, 2012). However, the interrelations between emotional schemas and other aspects of psychoemotional functioning remain largely unexamined by research. Integrating and expanding on previous literature, the current study proposes and assesses a unified model of emotional schemas and psychoemotional functioning.

Emotional Schemas

Emotional schemas are individualized conceptualizations and beliefs about emotions and emotional experiences that shape the ways an individual relates to their private, emotional experiences. Theoretical basis for emotional schemas stems primarily from the theory of meta-cognitive beliefs (Wells, 1995). Briefly, meta-cognitive theories suggest people hold beliefs about the nature of their own cognitive processes, and these beliefs shape how the individual attempts to control and respond to cognitive processes (Wells, 1995). Within the context of emotions, emotional schema (also sometimes referred to as “beliefs about emotion” or “metaemotion”) theories suggest core beliefs (i.e., schemas) about emotions and emotional processes drive the nature of an individual's reactions to emotional experiences (Edwards & Wupperman, 2019; Leahy, 2002; Manser, Cooper, & Trefusis, 2012; Mitmansgruber, Beck, Höfer, & Schüßler, 2009). Emotional schemas include various beliefs about emotion, such as typical course, causes and consequences, implications of emotions on self-concept, and appropriate and effective means of regulating emotion, and appear strongly influenced by cultural norms, socialization history, and past emotional experience (e.g., Edwards & Wupperman, 2019).

Schemas that foster self-validation and acceptance are often theorized to contribute to adaptive psychoemotional functioning, whereas schemas that encourage self-judgment are considered maladaptive and to perpetuate psychoemotional difficulty (Edwards & Wupperman, 2019; Leahy, 2002; Norman & Furnes, 2016). Correspondingly, research suggests emotional schemas typically considered “maladaptive” are closely associated with psychopathology. Some schemas – such as those that characterize emotional expression as socially harmful – are common across a range of psychopathology (i.e., eating, depressive, and anxiety disorders;

Brockmeyer et al., 2013; Krause, Robins, & Lynch, 2000; Mongrain & Vettese, 2003; Spokas, Luterek, & Heimberg, 2009). In contrast, other schemas – such as those that characterize intense emotional arousal as dangerous and of indefinite duration – appear limited to certain forms of psychopathology (i.e., generalized anxiety, panic, and posttraumatic stress disorders, but not depressive, obsessive-compulsive, or phobic disorders; Naragon-Gainey, 2010; Olatunji, Wolitzky-Taylor, 2009).

Emotional Schemas & Psychoemotional Functioning

Early process models of emotional schemas (e.g., Leahy, 2002) suggested complex interrelationships between emotional schemas and psychoemotional functioning. Specifically, emotional schemas were theorized to (1) drive the nature of early engagement with emotional experiences (e.g., emotion processing, cognitive avoidance versus engagement), which in turn, (2) influences the nature and effectiveness of emotion regulation and (3) shapes behavioral regulation. See Figure 1 for a graphical representation of this model. Consistent with these suggestions, third-wave behavior therapies commonly suggest acceptance of and openness to emotional experiences (representing fundamental emotional schemas about the acceptability of emotion) allow for (1) adaptive non-avoidance and processing of emotions (often through mindfulness), which facilitates (2) effective application of emotion-regulation strategies (3) management of behavior in emotional situations (Linehan, 1993; Hayes et al., 1999).

Unfortunately, research to date has not formally tested this comprehensive model of emotional schemas. However, correlational research preliminarily supports theorized associations – specifically, that individuals holding maladaptive emotional schemas (e.g., emotions as invalid and uncontrollable) also tend to display poorer emotion processing, higher emotional avoidance, and greater difficulty with emotional and behavioral dysregulation than individuals holding adaptive emotional schemas (e.g., emotions as normative and temporally finite). For example, alexithymic trait severity (i.e., an emotion processing deficit characterized by difficulties in identifying and communicating emotional experiences) correlates positively with negative expectations about the effects of somatic emotional arousal, beliefs that emotional expression is socially harmful, and general endorsement of maladaptive emotional schemas (Edwards, Micek, Mottarella, & Wupperman, 2017; Müller, Bühner, Ziegler, & Şahin, 2008; Sánchez, Larrieux, Rovira, & Ball, 2013; Stewart, Zvolensky, & Eifert, 2002). Overreliance on avoidance-based regulation strategies also correlates with negative expectations about the effects of somatic emotional arousal and emotional expression (Krause, Mendelson, & Lynch, 2003; Simpson, Jakupcak, & Luterek, 2006; Stewart et al., 2002). Further, various maladaptive emotional schemas, including beliefs that emotions are uncontrollable, intolerable, and dangerous, are also commonly endorsed by persons who habitually engage in dysregulated behaviors, such as binge-eating and alcohol use (Corstorphine, 2006; Manser et al., 2012; Stewart, Zvolensky, & Eifert, 2001).

Despite the growing body of literature on relations between emotional schemas and psychoemotional functioning, however, literature in this area is often fragmented by inconsistent operationalization and lack of a central, theoretical model across research. Indeed, correlational research has included a range of often idiosyncratic measures of emotional schemas (e.g., measures that specifically assess beliefs about the social consequences of emotion without assessing emotional schemas more broadly) and developed with little regard for larger theories

on emotional schemas. Furthermore, such literature is built largely on young-adult samples, raising questions of generalizability. Because of these limitations, the role of emotional schemas within the broader context of psychoemotional functioning remains largely unclear.

Current Study

Based in previous research, the current research introduces and evaluates an integrated theoretical model in which effects of maladaptive emotional schemas on dysregulated behavior are at least partially mediated by deficits in emotion processing, use of avoidance-based regulation, and emotion-regulation ineffectiveness. Consistent with third-wave behavior therapies and early models of emotional schemas, the model proposes that maladaptive emotional schemas (i.e., those which characterize emotions as problematic and encourage self-judgment) are associated with disruptions in early engagement with emotional experiences by impairing emotion processing and promoting avoidance. Such disruptions are then associated with less success in emotion regulation attempts and, in turn, greater risk of behavioral dysregulation. See *Figure 1*.

To also investigate the potential generalizability of this model across assessment methods and samples, the current research involved two independent studies. Study 1 utilized a combination of self-report and performance-based measures with a young-adult sample, whereas Study 2 utilized a combination of self-report, performance-based, and behavioral measures with a community sample.

Study 1

Study 1 investigated fit of the proposed model through use of a cross-sectional design, sampling from an undergraduate population, and including a combination of self-report and performance-based measures. Similarity between this methodology and most previous research on psychoemotional functioning (i.e., correlational or cross-sectional, undergraduate samples, self-report measures) allowed Study 1 to investigate the extent to which the proposed model may provide a working, integrative framework to organize and understand previously observed associations between psychoemotional constructs.

Study 1 Method

Participants

A total of 301 undergraduate students completed Study 1. Participants were recruited through a university departmental research-experience program within the Southeastern United States and compensated with course credit. Approximately 75% of participants identified as female, and most participants were under age 21. See *Table 1* for detailed demographic information about participants in Study 1.

Materials

Maladaptive Emotional Schemas. Endorsement of maladaptive emotional schemas was assessed using the Leahy Emotional Schema Scale-II (LESS-II; Leahy, 2012). The LESS-II is a 28-item self-report measure assessing endorsement of common beliefs about emotion and

emotional experiences (e.g., expectations that emotions will be rejected by others). Total score reflects degree of general endorsement of maladaptive emotional schemas. The LESS-II total score has demonstrated good internal reliability and concurrent validity in various samples (e.g., Batmaz & Özdel, 2015; Edwards et al., 2017; Leahy, 2015). In the current sample, internal reliability was good ($\alpha = 0.84$).

Emotion-Processing Deficits. A computerized version of the Perception of Affect Task (PAT; Rau, 1988) was used to assess participants' emotion-processing ability. The PAT is a performance-based measure consisting of 140 items divided into four, 35-item tasks. Previous research has validated each PAT task independently as well as the total PAT (Rau, 1988). To decrease time and burden of study completion, Study 1 included only Tasks 1 and 3. Task 1 involves matching emotional content in sentences with emotional words. Task 3 involves matching emotional content in sentences with emotional facial expressions. Proportion of accurate matches within each task is interpreted as reflecting emotion-processing ability, with higher scores denoting greater ability. The PAT has demonstrated adequate internal reliability and concurrent validity in both clinical and nonclinical samples (Lane et al., 1996; Lane, Sechrest, Riedel, Shapiro, & Kaszniak, 2000; Rau, 1988; 1992). In the current sample, the internal reliability of PAT Task 1 and 3 were adequate ($\alpha = 0.74$ and 0.84 , respectively).

Avoidance-Based Regulation. The tendency to adopt avoidance-based regulation strategies was assessed using the Cognitive-Behavioral Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004). The CBAS consists of 31 self-report items describing behavioral and cognitive avoidance strategies commonly used in social and nonsocial contexts (e.g., *I just wait out tension in my relationships hoping that it will go away*). Scores on the CBAS reflect degree of reliance on avoidance-based regulation strategies, with higher scores indicating greater reliance. The CBAS has demonstrated strong internal reliability, test-retest reliability, and concurrent and discriminant validity in nonclinical samples (Carvalho & Hopko, 2011; Moulds, Kandris, Starr, & Wong, 2007; Ottenbreit & Dobson, 2004). In the current study, the CBAS demonstrated good internal reliability ($\alpha = 0.94$).

Emotion-Regulation Ineffectiveness. Emotion-regulation ineffectiveness was assessed using the Generalized Expectancy for Negative Mood Regulation Scale (NMR; Catanzaro & Mearns, 1990). Whereas other measures of emotion regulation assess a broad range of psychoemotional difficulties (e.g., items on the Difficulties in Emotion Regulation Scale assess lack of effective emotion-regulation strategies in addition to factors related to emotion processing, avoidant coping, emotional schemas, and behavioral dysregulation), the NMR more narrowly assesses *outcome* of emotion-regulation attempts through 30, self-report items about expectations of emotion-regulation effectiveness (e.g., *When I'm upset, I believe that I can do something to feel better*). High scores on the NMR reflect perceived ability to regulate emotions effectively, whereas low scores reflect perceived difficulties in emotion regulation. The NMR has demonstrated strong internal reliability and concurrent and predictive validity in various clinical and nonclinical samples (Bardeen, Fergus, Hannan, & Orcutt, 2016; Catanzaro & Mearns, 1990; Totterdell & Leach, 2001). Internal reliability in the current study was good ($\alpha = 0.89$).

Behavioral Dysregulation. Behavioral dysregulation – specifically, the inability to persist in goal-directed behavior when experiencing high-intensity emotions – was assessed using the

negative urgency subscale of the UPPS-P Impulsive Behavior Scale (UPPS-P; Lynam, Smith, Whiteside, & Cyders, 2006). The negative urgency subscale is a 12-item measure of the tendency to engage in impulsive behavior, particularly when feeling high-intensity emotions (e.g., *When I feel bad, I will often do things I later regret in order to make myself feel better now*). High scores reflect greater inability to persist in goal-directed behavior when experiencing high-intensity emotions. The negative urgency subscale of the UPPS-P has shown good internal reliability, test-retest reliability, and concurrent validity in various samples (Adams, Kaiser, Lynam, Charnigo, & Milich, 2012; Pearson, Combs, Zapolski, & Smith, 2012; Racine et al., 2013). Internal reliability in the current study was good ($\alpha = 0.90$).

Procedure

Potential participants for Study 1 were recruited using online advertising available through the departmental research-experience program at [REMOVED FOR PEER REVIEW]. After registering to participate, participants were directed to an online webpage to provide consent and complete study measures. Five attention-check questions (i.e., “If you are paying attention, mark three for this question.”) were included amidst other study questions to determine participant attention; participants failing one or more of these questions (i.e., marking anything other than three) were excluded from analyses. Upon completion of the study, participants were granted course credit as compensation for their participation. All methods were pre-approved through the ethics boards at [REMOVED FOR PEER REVIEW] and [REMOVED FOR PEER REVIEW].

Data Analysis Plan

Path analysis using the *lavaan* package for R (v 3.4.4) was used to assess the proposed theoretical model (Figure 1) and estimate the relations between maladaptive emotional schemas (LESS-II), emotion-processing deficits (PAT), use of avoidance-based regulation (CBAS), emotion-regulation ineffectiveness (NMR), and behavioral dysregulation (UPPS-P). Throughout these analyses, the LESS-II total score was the exogenous variable in the model; PAT, CBAS, NMR, and UPPS-P scores were endogenous variables; demographic variables showing statistically significant correlation to study variables were also included as covariates. Potential mediational relationships were examined by calculating z-tests and standard errors for all indirect effects. Model fit statistics, residuals, and local fit were also analyzed using procedures outlined by Kline (2015).

Study 1 Results

Transformations & Descriptive Statistics

A total of 33 participants were excluded from the sample due to invalid responding (defined as providing an incorrect response to one or more attention-check questions), resulting in a final sample of 268 participants. This sample size provided adequate statistical power to complete necessary correlational and regression analyses involved in path analyses (Faul, Erdfelder, Lang, & Buchner, 2007).

Participants' responses to each measure were scored in accordance with previously

published scoring instructions. Scores for the PAT and NMR were then multiplied by -1 so that higher scores on all measures could be interpreted as reflecting maladaptive or deficient psychoemotional functioning. After this transformation, the following corrections were used to ensure that data satisfied assumptions of multivariate analyses (Kline, 2015): (a) Mahalanobis distances were used to identify and exclude multivariate outliers ($n = 7$); (b) scores on the PAT were also multiplied by 10 to decrease the relative difference between score variances; rescaled scores were then used in place of raw scores in all subsequent analyses. Descriptive statistics for study measures after transformations and exclusion of outliers are listed in *Table 2*.

Correlation Analyses & Demographic Covariates

Associations between study variables were first investigated using correlational analyses. See *Table 3* for a summary of these analyses.

The relation of study variables to collected demographic variables was then examined through exploratory correlational and ANOVA analyses. Results of these analyses indicated significant relations between study variables and gender and race. With regard to gender, female participants' emotion-processing ability was significantly superior to that of male participants $F(1, 257) = 7.24, p < .01, d = 0.37$. Regarding race, significant differences were noted in emotion-processing ability, $F(5, 253) = 2.42, p = .04$, and endorsement of emotional schemas, $F(5, 253) = 3.63, p < .01$. Specifically, participants identifying as Hispanic earned lower overall scores on the PAT than participants identifying as Asian, $t(82) = 2.31, p = .02, d = -0.67$, mixed race, $t(74) = 2.01, p = .03, d = -0.69$, and Non-Hispanic White, $t(191) = 2.77, p < .01, d = -0.42$; participants identifying as Non-Hispanic White reported less maladaptive emotional schemas than participants identifying as mixed race, $t(137) = 2.80, p = .01, d = -0.89$, Black, $t(160) = 2.67, p < .01, d = -0.51$, and Hispanic, $t(191) = 2.23, p = .03, d = -0.35$. Given these patterns of association, gender and race were included as covariates in all subsequent analyses.

Path Analyses

Next, the *lavaan* package for R was used to assess the proposed theoretical model through recursive path analysis using maximum likelihood estimation. Given their statistically significant association with study variables, gender and race were dummy-coded and included as exogenous variables in the path analysis, with gender predicting PAT total scores (emotion-processing deficits) and race predicting PAT total scores (emotion-processing deficits) and LESS-II total scores (maladaptive emotional schemas). For gender, male was used as the reference category; for race, Non-Hispanic White was used as the reference category.

Global fit statistics suggested the model was a good fit to the data, $\chi^2(22, N = 261) = 20.58, p = .55$, CFI = 1.00, RMSEA = 0.00, 90% CI [0.00 – 0.05], SRMR = 0.03. At the local fit level, correlation and standardized residuals reflected no appreciable disagreements between the data and the proposed model. See *Supplementary Table 1* for correlation and standardized residuals in Study 1.

The proposed theoretical model explained approximately 11% of the variance in emotion-processing deficits, $R^2 = 0.11, SE = 0.03$, 95% CI [0.04 – 0.18], 31% of variance in avoidance-based regulation, $R^2 = 0.31, SE = 0.05$, 95% CI [0.21 – 0.40], 45% of variance in

emotion-regulation ineffectiveness, $R^2 = 0.45$, $SE = 0.04$, 95% CI [0.37 – 0.54], and 7% of variance in behavioral dysregulation, $R^2 = 0.07$, $SE = 0.03$, 95% CI [0.01 – 0.12]. Examination of individual paths suggested some inconsistency in the strength and direction of association between variables. First, emotion-processing deficits showed no significant conditional associations with other variables of interest, β s = -0.04 – 0.12, p s = .05 – .56. These findings are consistent with correlational analyses, which suggested no significant correlations between scores on the PAT and other study measures. Also, avoidance-based regulation showed a significant, negative conditional association with dysregulated behavior ($\beta = -0.22$, $p < .01$). Because avoidance-based regulation was not significantly associated with dysregulated behavior in correlation analyses, such results suggest an unhypothesized suppression effect. *Figure 2* provides a graphical representation of these results, with significant path coefficients denoted in bold. See *Table 4* for a summary of observed path coefficients and residual variance.

Consistent with the lack of significant associations noted between emotion-processing deficits and other psychoemotional variables in path analyses, results of mediation analyses reflected all mediation relationships *except those involving emotion-processing deficits* to be statistically significant. Specifically, the relation of maladaptive emotional schemas to behavioral dysregulation was significantly mediated by avoidance-based regulation ($\beta = -0.14$, $SE = 0.05$, $p < .01$) and emotion-regulation ineffectiveness ($\beta = 0.08$, $SE = 0.04$, $p = .03$), but not emotion-processing deficits ($\beta < .01$, $SE < .01$, $p = .65$). The relation of maladaptive emotional schemas to emotion-regulation ineffectiveness was similarly significantly mediated by avoidance-based regulation ($\beta = 0.20$, $SE = 0.03$, $p < .01$), but not emotion-processing deficits ($\beta < .01$, $SE < .01$, $p = .67$). Lastly, emotion-regulation ineffectiveness significantly mediated the relation of avoidance-based regulation to behavioral dysregulation ($\beta = 0.07$, $SE = 0.04$, $p = .03$), but not the relation of emotion-processing deficits to behavioral dysregulation ($\beta < .01$, $SE < .01$, $p = .54$).

Study 2

Study 2 also utilized a cross-sectional design to investigate the associations between psychoemotional constructs. Study 2 aimed to both (a) conceptually replicate results of Study 1 and (b) investigate the extent to which the proposed model may generalize to diverse populations and/or alternative modes of assessing psychoemotional functioning. As such, Study 2 sampled from a diverse, community population in New York City and utilized a combination of self-report, performance-based, and behavioral measures.

Study 2 Method

Participants

Potential participants for Study 2 were recruited using online advertising in the New York City area. A total of 219 participants completed the study in full. Each subject was provided \$10.00 and one round-trip NYC Metro Card as compensation for their time and travel. Consistent with the diversity of the New York City community, most participants identified as racial minority, and 40% identified as working class. See Table 1 for detailed demographic information about Study 2 participants.

Materials

As in Study 1, endorsement of maladaptive emotional schemas was assessed using the Leahy Emotional Schema Scale-II (LESS-II; Leahy, 2012); emotion processing ability was assessed using a computerized version of the Perception of Affect Task tasks 1 and 3 (PAT; Rau, 1988), and tendencies to adopt avoidance-based regulation strategies were assessed using the Cognitive-Behavioral Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004).

Behavioral Dysregulation & Emotion Regulation Ineffectiveness. Previous research suggests behavioral and self-report measures of behavioral dysregulation do not always significantly correlate with one another, possibly because self-report measures tend to assess at the *trait level*, whereas behavioral measures assess at the *state level* (Cyders & Coskunpinar, 2011). It was therefore deemed critical to also examine fit of the proposed model when using *state-level, behavioral measures* of behavioral dysregulation (rather than only examining fit with trait-level, self-report measures). Correspondingly, behavioral dysregulation was assessed using a computerized version of the Mirror Tracing Persistence Task (MTPT-C; Strong et al., 2003), a behavioral measure of behavior dysregulation. Although previous research suggests the MTPT-C (like many behavioral measures of behavioral dysregulation) does not significantly correlate with the negative urgency subscale of the UPPS-P (used in Study 1; Brown et al., 2018), it is similarly conceptualized as a measure of ability to persist in goal-directed behavior when experiencing emotional distress (Strong et al., 2003).

The MTPT-C requires participants to trace a complex, geometric figure (i.e., a 5-point star) using a computer mouse¹. To increase difficulty and frustration of the task, MTPT-C is designed such that movement of the mouse corresponds to reverse movements of the on-screen cursor. Errors in tracing (i.e., gross deviations of tracing from the outline of the star) and prolonged lack of movement (i.e., 2+ seconds) sound a loud buzzer and prompt the participant to restart the task from the starting position. Consistent with initial development of the MTPT-C, participants were allowed a maximum of five minutes to complete the task and the option to discontinue the task at any time. Behavioral dysregulation was inferred from participants' persistence of goal-directed behavior, operationalized as the length of time from task start to termination. Average number of errors per second were also calculated to statistically control for skill level on persistence scores.

Following completion of the MTPT-C, participants rated the extent to which their emotions interfered with their ability to complete the MTPT-C (i.e., "*How much did your emotions interfere with your ability to complete the tracing task?*"). Ratings were completed using a Likert-format scale of 1 (no interference) to 9 (extreme interference). Given the inherently distressing nature of the MTPT-C, effective emotion regulation was presumed necessary to limit emotional interference during task completion; as such, participants' reported ratings of emotional interference were interpreted as reflecting ineffectiveness of emotion regulation during task completion. Notably, this item's focus on emotional interference is slightly different from the focus on perceived emotion-regulation effectiveness of the NMR in Study 1. Nevertheless, both measures assess a fundamental aspect of emotion dysregulation – the outcome of regulatory attempts.

¹ The task was programmed using JavaScript, HTML, and CSS. The 5-point star had an outer radius of 225 pixels and an inner radius of 90 pixels drawn with a line width of 15 pixels.

Procedure

Potential participants for Study 2 were recruited using online advertising throughout the Greater New York City area. Participants completed all study measures independently via computer in a university computer laboratory. Researchers were available throughout study completion to monitor engagement and answer questions as needed. As in Study 1, an attention-check question was included amidst other study questions to determine participant attention, and participants failing this question were excluded from analyses. After participants completed all study measures, they were debriefed and compensated for their time and travel. All methods were pre-approved through the ethics board at [REMOVED FOR PEER REVIEW].

Data Analysis Plan

Path analysis using the *lavaan* package for R (v 3.4.4) was used to assess the proposed theoretical model (Figure 1) and estimate the relations between maladaptive emotional schemas (LESS-II), emotion-processing deficits (PAT), use of avoidance-based regulation (CBAS), emotion-regulation ineffectiveness (emotion-regulation ineffectiveness question), and behavioral dysregulation (MTPT-C). Throughout these analyses, the LESS-II total score was the exogenous variable in the model; PAT, CBAS, emotion-regulation ineffectiveness question, and MTPT-C scores were endogenous variables; demographic variables showing statistically significant correlation to study variables and number of errors during the MTPT-C were also included as covariates. Potential mediational relationships were examined by calculating z-tests and standard errors for all indirect effects. Model fit statistics, residuals, and local fit were also analyzed using procedures outlined by Kline (2015).

Study 2 Results

Transformations & Descriptive Statistics

A total of 29 participants were excluded from Study 2 analyses for failing the attention-check question, resulting in a final sample size of 190 participants. This sample size provided adequate statistical power to complete necessary correlational and regression analyses involved in path analyses (Faul et al., 2007).

Participants' responses to each measure were scored in accordance with previously established scoring instructions. To aid in ease of result interpretation, PAT and MTPT-C scores were multiplied by -1 so that higher scores in all measures may be interpreted as reflecting deficits in psychoemotional functioning. As in Study 1, corrections were used to ensure data satisfied assumptions of multivariate analyses (Kline, 2015). Mahalanobis distances were used to identify and exclude two multivariate outliers. Scores on the PAT and MTPT-C were also multiplied by a constant (i.e., 10 or .01) to decrease the relative difference between score variances; rescaled scores were then used in place of raw scores in all subsequent analyses. Descriptive statistics for study measures after transformations and exclusion of outliers are listed in *Table 5*.

Correlation Analyses & Demographic Covariates

Associations between study variables were investigated using correlational analyses. See

Table 6 for a summary of these analyses.

The relation of study variables to collected demographic variables was then examined through exploratory correlational and ANOVA analyses. Unlike Study 1, data in Study 2 showed no significant associations between study variables and gender or race. Significant associations were, however, noted for age and socioeconomic status; age and socioeconomic status were therefore included as covariates in all subsequent analyses. Regarding age, older participants tended to endorse less maladaptive emotional schemas, $r = -0.23$, $p < .01$, and to rely less on avoidance-based regulation strategies, $r = -0.15$, $p = .05$, than younger participants. Regarding socioeconomic status, participants identifying as “Lower Middle Class” tended to report significantly more maladaptive emotional schemas than participants identifying as “Middle Class,” $t(93) = 2.77$, $p = .01$, $d = -0.60$, and poorer emotion processing than participants identifying as “Middle Class,” $t(93) = 2.23$, $p = .03$, $d = -0.46$, or “Upper Middle Class,” $t(45) = 2.42$, $p = .02$, $d = -0.81$. Participants identifying as “Working Class” also demonstrated poorer emotion processing than participants identifying as “Upper Middle Class,” $t(89) = 2.23$, $p = .03$, $d = -0.68$.

Path Analyses

The *lavaan* package for R was then used to assess the proposed theoretical model using recursive path analysis with maximum likelihood estimation. Due to their statistically significant association with study variables, socioeconomic status (dummy coded) and age were included as exogenous variables in path analyses, with socioeconomic status predicting LESS-II total scores and PAT total scores (working class used as the reference category) and age predicting LESS-II total scores and CBAS total scores.

Global fit statistics suggested the model was a good fit to the data, $\chi^2(19, N = 188) = 21.09$, $p = .33$, CFI = 0.99, RMSEA = 0.02, 90% CI [0.00 – 0.07], SRMR = 0.04. At the local fit level, correlation and standardized residuals reflected no appreciable disagreements between the data and the proposed model. See *Supplemental Table 2* for correlation and standardized residuals in Study 2.

In Study 2, the proposed theoretical model explained approximately 5% of the variance in emotion-processing deficits, $R^2 = 0.05$, SE = 0.03, 95% CI [-0.01 – 0.10], 38% of the variance in avoidance-based regulation, $R^2 = 0.38$, SE = 0.05, 95% CI [0.27 – 0.49], 6% of the variance in emotion-regulation ineffectiveness, $R^2 = 0.06$, SE = 0.03, 95% CI [0.00 – 0.12], and 12% of the variance in behavioral dysregulation, $R^2 = 0.12$, SE = 0.04, 95% CI [0.04 – 0.20]. As in Study 1, emotion-processing deficits showed very little association with other variables of interest. A significant, negative conditional association was also observed between avoidance-based regulation and behavioral dysregulation, $\beta = -0.24$, $p < .01$, similar to the unhypothesized suppression effect observed in Study 1. Unlike in Study 1, however, maladaptive emotional schemas and emotion-regulation ineffectiveness showed very weak conditional associations with most other variables of interest. Also, a significant, positive conditional association was observed between emotion-processing deficits and behavioral dysregulation, $\beta = 0.15$, $p = .03$. See *Figure 3* for a graphical representation of these results, with significant path coefficients denoted in bold, and *Table 7* for a summary of observed path coefficients and residual variances.

Unlike Study 1, mediation analyses in Study 2 suggested only one statistically significant mediation relationship. Avoidance-based regulation significantly mediated the relation between maladaptive emotional schemas and behavioral dysregulation, $\beta = -0.23$, $SE = 0.09$, $p < .01$. However, all other mediation relationships were not significant.

Discussion

The current research introduced and evaluated a preliminary, integrative model of emotional schemas and psychoemotional functioning through two independent studies. Though further research is necessary, cumulative findings provide preliminary support for the proposed model. Collapsing across studies, four major findings were noted. First, complex interrelations between psychoemotional factors suggest that few, if any, full mediational relationships exist between variables. Second, maladaptive emotional schemas (e.g., those characterizing emotions as invalid, dangerous, unacceptable, intolerable, etc.) were associated with various psychoemotional factors, particularly avoidant coping, emotion-regulation ineffectiveness, and behavioral dysregulation. Third, behavioral dysregulation appeared to stem from a combination of emotion-regulation ineffectiveness, avoidant coping, emotion-processing deficits, and maladaptive emotional schemas. Lastly, the proposed model did not adequately explain emotion-processing deficits as assessed in the current research. Implications of each of these findings are detailed below.

Interrelations between Psychoemotional Factors

Across two, independent samples, results suggested complex interrelations between assessed psychoemotional factors. Although Study 1 suggested various mediational relationships between variables, only one of these mediations were replicated in Study 2. These results suggest maladaptive emotional schemas, emotion-processing deficits, avoidant coping, emotion-regulation ineffectiveness, and behavioral dysregulation – while interrelated – likely serve unique and semi-independent roles within the context of psychoemotional functioning. Accordingly, investigations into psychoemotional functioning may benefit from a wholistic approach that considers each factor within the context of a larger psychoemotional system.

Though further replication and investigation is needed, the proposed model could serve as a useful tool for organizing psychoemotional research and interventions moving forward. The model suggests that targeting any singular aspect of psychoemotional functioning (e.g., avoidant coping) may have ancillary effects on other psychoemotional factors (e.g., emotion-regulation ineffectiveness) given strong interrelations between factors. However, the lack of meaningful mediation relationships also suggests this targeted approach is unlikely to fully resolve non-targeted factors. The model may therefore support treatments in adopting wholistic conceptualizations and treatment approaches for psychoemotional functioning, such as those commonly seen in third-wave behavior therapies. For example, through “DBT Skills,” Dialectical Behavior Therapy addresses emotion processing, avoidance, emotion regulation, and behavioral dysregulation through instruction on mindfulness, acceptance, emotion regulation strategies, and distress tolerance, respectively (Linehan, 1993). This multi-targeted approach may explain the success of recent efforts to provide DBT Skills groups as a standalone treatment for dysregulated behavior (Valentine, Bankoff, Poulin, Reidler, & Pantalone, 2015). Acceptance and Commitment Therapy has a similar multi-target approach; its focus on experiential avoidance

targets both avoidant coping and reactions to private emotional experiences as treatment targets (Hayes & Wilson, 1994).

Emotional Schemas in Psychoemotional Functioning

The current research also replicates and expands upon previous investigations into emotional schemas. Early emotional schema theories suggested emotional schemas to influence psychoemotional functioning by driving reactions to and management of emotional experiences (Leahy, 2002; Manser et al., 2012; Mitmansgruber et al., 2009). Consistent with this, across both studies, individuals' endorsement of common maladaptive emotional schemas (e.g., emotions as dangerous, uncontrollable, socially unacceptable, etc.) was associated with a greater tendency to adopt avoidance-based coping strategies that distance oneself from emotional experiences and situations.

Though protective in the short-term (the person avoids the discomfort of experiencing emotions perceived as dangerous), avoidant coping typically restricts opportunity for learning by limiting exposure to experiences that are inconsistent with maladaptive belief systems (e.g., effectively coping with an intense emotion; Delgado, Jou, LeDoux, & Phelps, 2009). Changing maladaptive emotional schemas may therefore require interventions that (a) limit avoidant coping and (b) provide exposure to experiences and/or situations in which emotions are experienced as valid, unacceptable, and controllable. Many third-wave therapies structure the therapeutic context in service of these aims. For example, mindfulness encourages full, nonavoidant experiencing of emotion from a stance of nonjudgment and self-validation (Bishop et al., 2004; Kabat-Zinn, 1982). Use of validation strategies within therapeutic interactions may similarly challenge maladaptive emotional schemas by communicating acceptance and validity of psychoemotional experience (Koerner & Linehan, 2003; Linehan, 1997). Because emotional schemas serve a prominent role within the psychoemotional system, these approaches are likely crucial for improving psychoemotional functioning.

Behavioral Dysregulation in Psychoemotional Functioning

Findings also highlighted, consistent with previous research, that behavioral dysregulation – specifically, the inability to persist in goal-directed activity during times of high emotionality – stems from a combination of psychoemotional factors, particularly emotion-regulation ineffectiveness. Because behavioral dysregulation was assessed at the trait-level in Study 1 and at the state-level in Study 2, findings suggest these complexities may occur both over time and within a single instance of behavioral dysregulation.

Across two independent sample, behavioral dysregulation was most closely associated with emotion-regulation ineffectiveness. Specifically, participants were less persistent in goal-directed behaviors when emotion-regulation strategies were ineffective and/or insufficient in managing emotional distress. In Study 1, this pattern occurred at the trait level such that participants who reported low perceived ability to regulate emotions also reported higher engagement in dysregulated behavior. Similarly, in Study 2, participants who experienced momentary emotional distress as disruptive were faster to prematurely terminate a distressing task. Such findings are consistent with previous characterizations of behavioral dysregulation as resulting from emotion-regulation burnout and serving to decrease emotional distress when other

attempts at emotion regulation are unsuccessful and/or insufficient (Klonsky, 2011; Wedig & Nock, 2010). These results are also consistent with previous research suggesting dysregulated behavior is closely associated with difficulties in emotion regulation (Anestis, Selby, Fink, & Joiner, 2007; Edwards & Wupperman, 2017; Selby & Joiner, 2009).

Inconsistent with the originally proposed model, behavioral dysregulation also had a *negative* conditional association with avoidant coping after controlling for emotion-regulation ineffectiveness in both Study 1 and Study 2. These results suggest that so long as avoidant coping does not interfere with emotion-regulation effectiveness, it may have an adaptive effect on behavioral dysregulation. Findings are inconsistent with popular conceptualizations of avoidance as inherently maladaptive (e.g., Fledderus, Bohlmeijer, & Pieterse, 2010) and instead suggest avoidance may be adaptive in certain contexts. For example, a man struggling with alcohol use may choose to avoid bars or pubs to decrease his chance of relapse. Within this context, if the avoidance does not interfere with other emotion-regulation efforts (e.g., by introducing new emotional distress associated with social exclusion), it is likely to have adaptive effects on drinking behavior. This emphasis on contextual fit of avoidant coping is consistent with recent theories suggesting optimal psychoemotional functioning prioritizes *flexibility* and *contextual fit* in emotion regulation rather than application of individual, inherently adaptive strategies (Aldao, Sheppes, & Gross, 2015; Bendezú & Wadsworth, 2017; Bonanno & Burton, 2013). Accordingly, future research should consider moving away from classifying regulation strategies as inherently “adaptive” or “maladaptive” and instead focus on identifying patterns of fit between strategies and psychoemotional experience, situational demands, and personal goals.

Emotion-Processing Deficits & Psychoemotional Functioning

In both studies, the proposed model of psychoemotional functioning was unable to replicate previously demonstrated associations between emotion-processing deficits and other psychoemotional factors. Various factors may have contributed to this model failure. First, sample characteristics may have yielded low variability in emotion-processing scores and an underrepresentation of emotion-processing deficits in the data. Consistent with this, no statistically significant associations were noted between emotion-processing deficits and other psychoemotional factors in Study 1, which utilized a relatively homogenous, high functioning sample. Conversely, statistically significant associations were observed between emotion-processing deficits and behavioral dysregulation in Study 2, which utilized a more diverse community sample. To avoid this limitation, future research should employ heterogeneous samples to ensure adequate variability in emotion-processing abilities across participants.

The lack of statistically significant association between emotion-processing deficits and other psychoemotional factors may have also stemmed from issues of construct validity. The Perception of Affect Task (PAT; Rau, 1988) is a performance-based measure of processing emotional information in sentences, words, and facial expressions. It can therefore be broadly conceptualized as assessing participants’ emotion-situation knowledge, emotion labeling, and facial-processing ability. The PAT does not assess other forms of emotion processing, such as recognition and understanding of emotional experiences in the self. It is therefore possible that the PAT was too narrow in scope to detect associations with other assessed psychoemotional factors. Given the large literature establishing emotion processing as playing a fundamental role in psychoemotional experience and functioning (e.g., Izard, 2010; Kret & Ploeger, 2015), future

investigations may consider whether alternative measures or forms of emotion processing (e.g., alexithymia) are more adequately explained by the model.

Sociodemographic Considerations

The proposed model showed strong global fit across two very disparate samples. The first sample included predominantly Caucasian, middle-class, undergraduate students in the Southeastern United States, whereas the second sample included predominantly racially and ethnically diverse, lower-socioeconomic status, community members from the greater New York City area. Though preliminary, generalization of the model across these two samples suggests the model may be valid across sociodemographic and geographic contexts within the United States. In both studies, results also suggested psychoemotional functioning was significantly associated with sociodemographic characteristics, suggesting sociodemographic considerations are likely necessary for adequate understanding of psychoemotional functioning.

Limitations

The current research should be understood within the context of a few methodological limitations. First, both Study 1 and Study 2 utilized cross-sectional designs. Therefore, although directionality is implied by underlying theories of emotional schemas and third-wave behavior therapies, results cannot be used to make unequivocal conclusions about causality and directionality of observed relationships. Most research on psychoemotional functioning has similarly relied on cross-sectional designs, because psychoemotional factors are presumed to exist as characterological traits that are unresponsive to experimental manipulation (indeed, even weeks of therapy may not be always successful in changing psychoemotional factors). Some research, however, has effectively manipulated participants' general approach toward emotion regulation within an individual task (e.g., acceptance versus suppression; Feldner et al., 2003; Feldner et al., 2006). Integration of such experimental methods through future research may aid in clarifying issues of causality and directionality suggested by the proposed model.

Second, the current research relied heavily on use of self-report measures of psychoemotional functioning, particularly in Study 1. Although a similar reliance is commonly observed within the literature on psychoemotional functioning, self-report methods are associated with various limitations, particularly biased response patterns stemming from research demand characteristics, self-presentation, and respondent insight (Paulhus & Vazire, 2005). Such reliance may have also contributed to an issue of common method variance among self-report variables, particularly in Study 1, which would at least partially explain the relatively stronger associations noted between variables in Study 1 versus Study 2. Continued research is therefore necessary to determine the extent to which the proposed model can be used to explain or predict behavioral outcomes, such as engagement in dysregulated behavior, use of emotion-regulation strategies across situations, or psychotherapy response.

Third, the current research may have included overly narrow operationalizations of study variables. For example, although the Perception of Affect Task assesses various aspects of emotion processing (i.e., emotion vocabulary, facial processing, and emotion-situation knowledge), it is not a comprehensive assessment of emotion processing. Some aspects of emotion processing are not assessed by the Perception of Affect Task – particularly ability to

process emotional information in the self (e.g., emotion differentiation, affect labeling, alexithymia, etc.). The extent to which these unassessed aspects of emotion processing may be better explained by the model therefore remains a question for further research. Relatedly, the MTPT-C, used in Study 2, assesses propensity toward behavioral dysregulation by measuring participant behavior within the narrow context of an idiosyncratic stressor (i.e., a mirror tracing task; Strong et al., 2003). Although the MTPT-C has demonstrated strong convergent validity with other behavioral measures (McHugh et al., 2011), some research suggests behavioral dysregulation is more likely to occur in the context of personally relevant versus idiosyncratic stressors (e.g., rejection by a loved one versus rejection by a stranger; Ebner-Priemer et al., 2015; Rosenthal et al., 2016). It is therefore possible that scores on the MTPT-C are biased by the extent to which participants appraise the tracing task as personally relevant. Future research may prioritize ecological validity to determine the extent to which the proposed model of psychoemotional functioning holds in more personally relevant contexts.

Future Directions

Though results provide preliminary evidence to support the proposed model as a viable tool, ongoing research is needed to further investigate and develop the model to account for growing research findings. Specifically, future research should investigate the following: (a) generalization of the model across populations, situations, and cultures; (b) replication of the model using different research designs (e.g., experimental, longitudinal, etc.) and modes of measurement (e.g., behavioral, ecological momentary assessment, etc.); (c) ability of the model to predict behaviorally and clinically-relevant outcomes in psychoemotional functioning; and (d) clarification of the role of emotion processing within the context of psychoemotional functioning. As ongoing research aids development and modification of the proposed model, research may also investigate the utility of the model within a clinical context.

Conclusions

The proposed model may be a valuable tool for organizing and guiding research. Findings across two studies suggest four key conclusions. First, psychoemotional functioning appears to stem from complex interrelations between maladaptive emotional schemas, emotion-processing deficits, avoidant coping, emotion-regulation ineffectiveness, and behavioral dysregulation. Second, emotional schemas may play a key role in guiding psychoemotional experience and functioning. Third, behavioral dysregulation is a complex construct stemming primarily from difficulties with emotion regulation. Last, the proposed model failed to highlight the role of emotion-processing deficits within the context of psychoemotional functioning. The current research also underlined the importance of conceptualizing and assessing psychoemotional functioning within the context of sociodemographic and cultural considerations. Ongoing research is needed to replicate and continue development of the proposed model of psychoemotional functioning.

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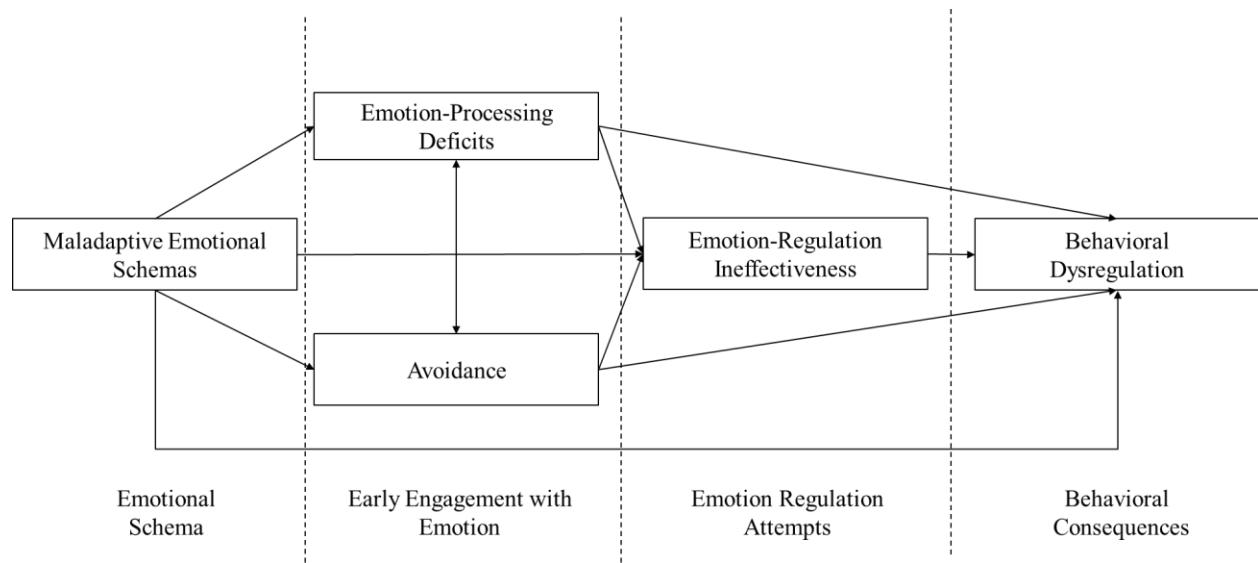
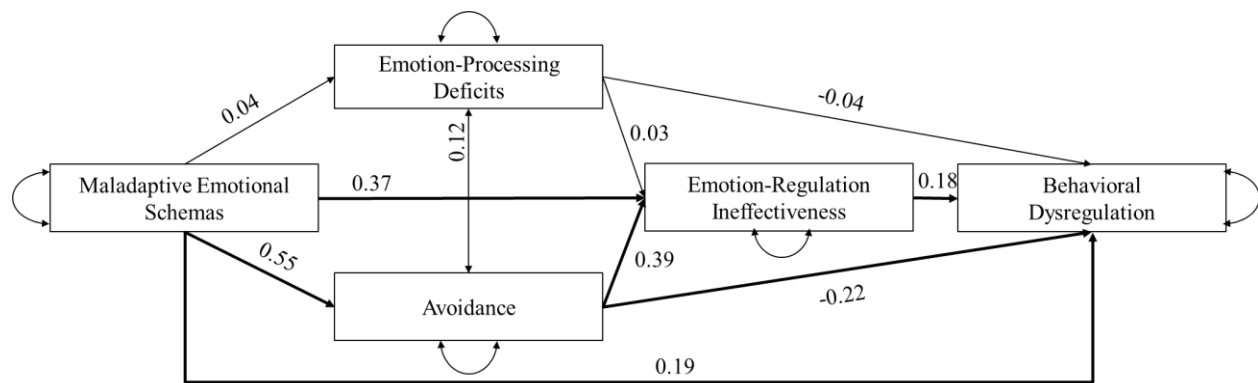
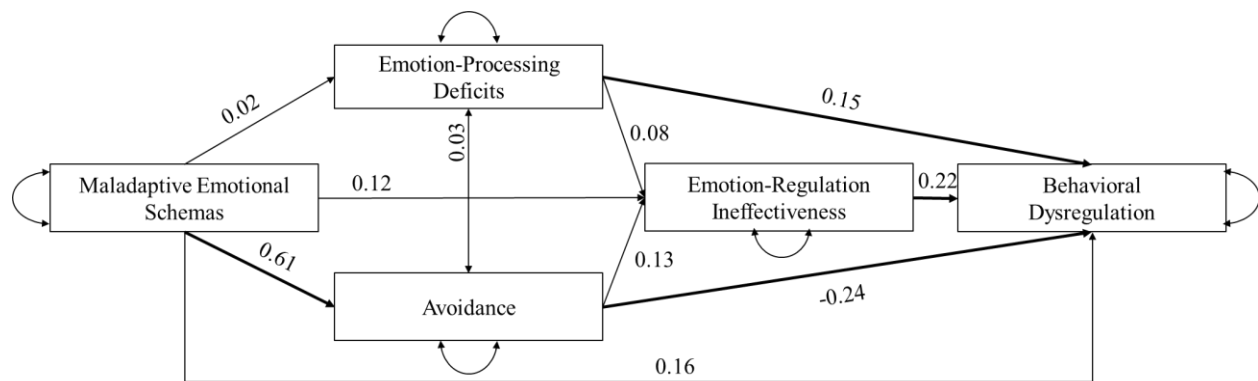
Figure 1: Proposed Theoretical Model

Figure 2: Study 1, Proposed Theoretical Model

*Because demographic correlates are not theoretically central to the proposed model, paths between demographic covariates and model variables are not listed. For details regarding these paths, see *Table 4*.

Figure 3: Study 2, Proposed Theoretical Model

*Because demographic correlates are not theoretically central to the proposed model, paths between demographic covariates and model variables are not listed. For details regarding these paths, see *Table 7*.

Table 1: Participant Demographics

Demographic	Study 1		Study 2	
	<i>n</i>	<i>N%</i>	<i>n</i>	<i>N%</i>
Gender				
Female	201	75%	101	46%
Male	65	24%	116	53%
Transgender	0	0%	1	<1%
Race				
Non-Hispanic White	130	49%	66	30%
Hispanic	68	25%	24	11%
Black/African American	35	13%	91	42%
Asian	19	7%	25	11%
Mixed-Race	12	5%	0	0%
Native American	2	<1%	0	0%
Pacific Islander	1	<1%	1	<1%
Socioeconomic Status				
Working Class	36	13%	87	40%
Lower Middle Class	34	13%	38	17%
Middle Class	144	54%	74	34%
Upper Middle Class	51	19%	18	8%
Upper Class	2	<1%	1	<1%
Sexual Orientation				
Heterosexual/Straight	248	93%	181	83%
Homosexual/Gay/Lesbian	7	3%	22	10%
Bisexual/Other	12	4%	15	7%
Country/Region of Origin				

United States	233	87%	176	80%
Caribbean Islands	11	4%	2	<1%
South America	6	2%	2	<1%
Asia	5	2%	13	6%
Europe/Russia	5	2%	7	3%
Central America	2	<1%	1	<1%
Africa	1	<1%	5	2%
Pacific Islands	0	0%	1	<1%
Australia	0	0%	1	<1%
Total Sample Size	268	100%	219	100%

Note: Due to missing data, totals may not always equal 100%. All demographic information reflects participants' self-reported identities.

Table 2: Study 1 Descriptive Statistics

	<i>M</i>	<i>SD</i>	Skew	Kurtosis
LESS-II	3.19	0.61	0.06	-0.31
PAT Task 1 (Words/Sentences) ^{a, b}	-9.25	0.73	1.95	5.36
PAT Task 3 (Faces/Sentences) ^{a, b}	-8.28	1.30	0.85	0.18
PAT Total ^{a, b}	-8.77	0.90	0.98	0.61
CBAS	2.10	0.65	0.56	-0.10
NMR ^a	-3.38	0.57	0.44	0.51
UPPS-P (Negative Urgency Subscale)	2.41	0.68	0.13	-0.47

^aScores multiplied by -1^bScores multiplied by 10

Table 3: Correlations & Covariances between Study 1 Variables

	LESS-II	PAT	CBAS	NMR	UPPS
Maladaptive Emotional Schemas	--	0.03	0.22	0.20	0.07
Emotion-Processing Deficits	.06 (.31)	--	0.06	0.05	-0.02
Avoidant Coping Style	.55 (<.01)	.11 (.06)	--	0.22	0.00
Emotion-Regulation Ineffectiveness	.59 (<.01)	.09 (.13)	.60 (<.01)	--	0.06
Behavioral Dysregulation	.17 (<.01)	-.04 (.58)	-.01 (.88)	0.16 (.01)	--
Correlations and p-values reflected in lower triangle; covariances reflected in upper triangle					

Table 4: Study 1, Proposed Theoretical Model Path Coefficients

Parameter	Unstandardized Coefficient	SE	z-value	p	Standardized Coefficient
LESS-II → PAT	0.05	0.09	0.59	.56	0.04
LESS-II → CBAS	0.60	0.06	10.73	< .01	0.55
LESS-II → NMR	0.35	0.05	6.74	< .01	0.37
LESS-II → UPPS	0.22	0.09	2.42	.01	0.19
PAT ↔ CBAS	0.06	0.03	1.94	.05	0.12
PAT → NMR	0.02	0.03	0.63	.53	0.03
PAT → UPPS	-0.03	0.05	-0.69	.49	-0.04
CBAS → NMR	0.34	0.05	7.03	< .01	0.39
CBAS → UPPS	-0.24	0.08	-2.83	.01	-0.22
NMR → UPPS	0.22	0.10	2.23	.03	0.18
LESS	0.34	0.03	11.42	< .01	0.93
PAT	0.73	0.06	11.42	< .01	0.89
CBAS	0.29	0.03	11.42	< .01	0.69
NMR	0.18	0.02	11.42	< .01	0.55
UPPS	0.44	0.04	11.42	< .01	0.93
<u>Demographic Covariates</u>					
Hispanic → LESS-II	0.21	0.09	2.37	.02	0.15
Black → LESS-II	0.33	0.11	2.92	< .01	0.18
Asian → LESS-II	0.27	0.14	1.86	.06	0.12
Native American → LESS-II	-0.31	0.41	-0.76	.45	-0.05
Pacific Islander → LESS-II	0.56	0.58	0.97	.33	0.06
Mixed Race → LESS-II	0.55	0.18	3.04	< .01	0.19

Gender → PAT	0.37	0.12	2.99	< .01	0.18
Hispanic → PAT	0.39	0.13	2.97	< .01	0.19
Black → PAT	0.13	0.17	0.78	.44	0.05
Asian → PAT	-0.23	0.21	-1.10	.27	-0.07
Native American → PAT	-0.33	0.60	-0.55	.58	-0.03
Pacific Islander → PAT	2.58	0.85	3.04	< .01	0.18
Mixed Race → PAT	-0.20	0.27	-0.75	.45	-0.05

Table 5: Study 2 Descriptive Statistics

	<i>M</i>	<i>SD</i>	Skew	Kurtosis
LESS-II	3.02	0.72	0.32	-0.38
PAT Task 1 (Words/Sentences) ^{a, b}	-8.69	1.16	1.35	1.98
PAT Task 3 (Faces/Sentences) ^{a, b}	-6.92	1.64	0.60	-0.20
PAT Total ^{a, b}	-7.80	1.24	0.69	-0.06
CBAS	1.88	0.62	0.72	-0.48
Emotion Regulation Ineffectiveness	4.68	2.48	0.08	-0.97
MTPT-C ^{a, c}	-1.65	1.14	-0.15	-1.73

^aScores multiplied by -1^bScores multiplied by 10^cScores multiplied by .01

Table 6: Correlations & Covariances between Study 2 Variables

	LESS-II	PAT	CBAS	EmoDys	MTPT-C
Maladaptive Emotional Schemas	--	0.04	0.27	0.37	0.05
Emotion-Processing Deficits	.05 (.54)	--	0.05	0.27	0.24
Avoidant Coping Style	.61 (<.01)	.07 (.34)	--	0.32	-0.06
Emotion-Regulation Ineffectiveness	.21 (.01)	.09 (.22)	.21 (<.01)	--	0.64
Behavioral Dysregulation	.06 (.44)	.18 (.02)	-.09 (.26)	.23 (<.01)	--

Correlations and p-values reflected in lower triangle; covariances reflected in upper triangle

Table 7: Study 2, Proposed Theoretical Model Path Coefficients

Parameter	Unstandardized Coefficient	SE	z-value	<i>p</i>	Standardized Coefficient
LESS-II → PAT	0.04	0.12	0.33	.74	0.02
LESS-II → CBAS	0.51	0.05	10.36	< .01	0.61
LESS-II → EmoDys	0.41	0.30	1.36	.18	0.12
LESS-II → MTPT-C	0.25	0.14	1.86	.06	0.16
PAT ↔ CBAS	0.02	0.04	0.46	.65	0.03
PAT → EmoDys	0.16	0.15	1.09	.27	0.08
PAT → MTPT-C	0.15	0.07	2.24	.03	0.15
CBAS → EmoDys	0.54	0.36	1.47	.14	0.13
CBAS → MTPT-C	-0.46	0.16	-2.80	<.01	-0.24
EmoDys → MTPT-C	0.10	0.03	3.10	<.01	0.22
LESS	0.47	0.05	9.70	<.01	0.89
PAT	1.33	0.14	9.70	<.01	0.96
CBAS	0.23	0.02	9.70	<.01	0.62
EmoDys	5.64	0.58	9.70	<.01	0.94
MTPT-C	1.12	0.12	9.70	<.01	0.88
<u>Covariates</u>					
Age → LESS-II	-0.01	<.01	-3.45	<.01	-0.24
Lower Middle SES → LESS-II	0.21	0.15	1.44	.15	0.11
Middle SES → LESS-II	-0.23	0.12	-2.01	.05	-0.15
Upper Middle SES → LESS-II	0.10	0.18	0.57	.57	0.04
Upper SES → LESS-II	0.76	0.67	1.14	.26	0.08
Lower Middle SES → PAT	0.20	0.25	0.82	.41	0.06

Middle SES → PAT	-0.30	0.20	-1.52	.13	-0.12
Upper Middle SES → PAT	-0.64	0.31	-2.09	.04	-0.16
Upper SES → PAT	-0.64	1.12	-0.58	.57	-0.04
Age → CBAS	<.01	<.01	-0.26	.80	-0.02
Tracing Errors → MTPT-C	-0.16	0.09	-1.75	.08	-0.12

Supplementary Table 1: Study 1-Local Fit Statistics

	LESS	PAT	CBAS	NMR	UPPS
<u>Correlation Residuals</u>					
LESS	0.00				
PAT	0.00	0.00			
CBAS	0.00	-0.02	0.00		
NMR	0.00	-0.01	0.00	0.00	
UPPS	0.00	0.00	0.00	0.00	0.00
<u>Standardized Residuals</u>					
LESS	0.00				
PAT	-0.02	-0.07			
CBAS	0.00	-0.34	0.00		
NMR	0.00	-0.14	-0.01	-0.01	
UPPS	0.00	0.05	0.01	0.01	0.00

Supplementary Table 2: Study 2 Local Fit Statistics

	LESS	PAT	CBAS	EmotionDys	MTPT-C
<u>Correlation Residuals</u>					
LESS	-0.01				
PAT	0.00	0.00			
CBAS	0.00	0.02	0.00		
EmotionDys	0.00	0.00	0.00	0.00	
MTPT-C	0.00	0.01	0.00	0.01	0.00
<u>Standardized Residuals</u>					
LESS	0.00				
PAT	0.00	0.02			
CBAS	0.00	0.27	0.00		
EmotionDys	0.00	0.04	0.02	0.00	
MTPT-C	-0.09	0.14	0.06	0.23	0.08