Emotional schemas and psychoemotional functioning: Introduction and evaluation of an integrated model across two independent samples

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Recent advancements in emotion theory propose that emotional schemas – individualized conceptualizations and beliefs about emotions – serve a fundamental function in guiding psychoemotional processes. These advancements have progressed alongside the development of third-wave therapies, which presume emotional schemas to be deeply involved in perpetuating psychological distress and emotional dysfunction. To critically assess the validity of this presumption, the current research proposed and evaluated an integrative model of psychoemotional functioning.

Two studies were completed using a combination of behavioral, performance-based, and self-report measures of emotional schemas and psychoemotional functioning. The integrated model suggests 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. Given the centrality of emotional schemas and psychoemotional functioning in third-wave therapies, the proposed model may inform future research on mechanisms of change in these treatments. The model may also be used to inform the development of novel intervention strategies to improve psychoemotional functioning.

Recent years have seen a rise in the popularity of third-wave behavior therapies. Third-wave behavior therapies are characterized by experiential treatment strategies that target a client's secondary reactions to private emotional experiences (e.g., mindfulness, acceptance, etc.). With some variation, these treatments theorize that strongly held beliefs about emotion may drive these secondary reactions, thereby shaping psychoemotional functioning (e.g., emotion processing, emotion regulation, behavior regulation, etc.).

Third-wave therapies, such as Dialectical Behavior Therapy (DBT), Functional Analytic Psychotherapy (FAP), and Acceptance and Commitment Therapy (ACT) have been shown to improve psychological wellbeing for various populations (Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004; Hayes, Villatte, Levin, & Hildebrandt, 2011; Kahl, Winter, & Schweiger, 2012; Öst, 2008). Despite these promising results, however, third-wave behavior therapies have been subject to considerable critique. For example, third-wave therapies were accused of "getting ahead of their data" (Corrigan, 2001,

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p. 192), and associated research has been criticized for having poor methodological design, suffering weak theoretical basis, and "overselling" the significance of findings (Donohue, Snipes, & Soto, 2016; Öst, 2008).

Consistent with these criticisms, one of the central tenants of third-wave behavior therapies – that psychological dysfunction and distress stem at least partially from maladaptive emotional schemas – still has limited empirical support. High quality research is needed to foster insight into the theoretical foundations of third-wave behavior therapies and investigate the role of emotional schemas in shaping the nature and quality of psychoemotional functioning.

Emotional Schemas

Emotional schemas are individualized conceptualizations and beliefs about emotions and emotional experiences. The theoretical basis for emotional schemas stems from the theory of meta-cognitive beliefs, which suggests people hold beliefs about the nature of their own cognitive processes (Edwards & Wupperman, 2019; Wells, 1995). The nature of these meta-cognitive beliefs shapes the strategies an individual adopts to control and respond to cognitive processes (Wells, 1995). Within the context of emotions, emotional schema theories suggest core beliefs (i.e., schemas) about emotions and emotional processes drive the nature of an individual's reasons to emotional experiences (Edwards & Wupperman, 2019; Leahy,

2002; Manser, Cooper, & Trefusis, 2012; Mitmansgruber, Beck, Höfer, & Schüßler, 2009). Emotional schemas may 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. Emotional schemas are strongly influenced by cultural norms, socialization history, and past emotional experience (Edwards & Wupperman, 2019). Emotional schemas that foster self-validation and acceptance are theorized to ultimately contribute to adaptive psychoemotional functioning, whereas schemas that encourage self-judgment are theorized to be maladaptive and to perpetuate psychoemotional difficulty (Edwards & Wupperman, 2019; Leahy, 2002; Norman & Furnes, 2016).

Emotional Schemas & Psychoemotional Functioning

Emotional schemas appear implicated in psychopathology. For example, the belief that emotional expression will result in harmful social consequences is closely associated with eating, anxiety, and depressive disorders (Brockmeyer et al., 2013; Krause, Robins, & Lynch, 2000; Mongrain & Vettese, 2003; Spokas, Luterek, & Heimberg, 2009). In contrast, the belief that intense emotional arousal is dangerous and, if triggered, would last indefinitely is particularly salient in generalized anxiety disorder, panic disorder, and post-traumatic stress disorder, but shows little relation to depressive disorders, obsessive-compulsive disorder, and social and specific phobias (Naragon-Gainey, 2010; Olatunji, Wolitzky-Taylor, 2009).

Individuals holding maladaptive emotional schemas (e.g., emotions as invalid and uncontrollable) also tend to display poorer emotion processing than individuals holding adaptive emotional schemas (e.g., emotions as normative and temporally finite). For example, alexithymic trait severity (i.e., 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 et al., 2017; Müller, Bühner, Ziegler, & Şahin, 2008; Sánchez, Larrieux, Rovira, & Ball, 2013; Stewart, Zvolensky, & Eifert, 2002).

Emotion-regulation difficulties are also common in individuals holding maladaptive emotional schemas. Overreliance on suppression and avoidance-based regulation strategies, for example, 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). 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).

Current Study

Despite the growing body of literature on the relation between emotional schemas and psychoemotional functioning, this literature is fragmented by inconsistent operationalization and lack of a central, theoretical model across research. Such literature is also 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.

Based in previous research and theories underlying third-wave behavior therapies, the current research introduces and evaluates a 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. See *Figure 1* for a graphical representation of the proposed model. To begin investigating the generalizability of the 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. Given the similarity between this methodology and most previous research on psychoemotional functioning (i.e., correlational or cross-sectional, undergraduate samples, self-report measures), Study 1 aimed 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.

Methods

Participants

A total of 268 undergraduate students completed Study 1. Participants were recruited through a departmental research-experience program 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.
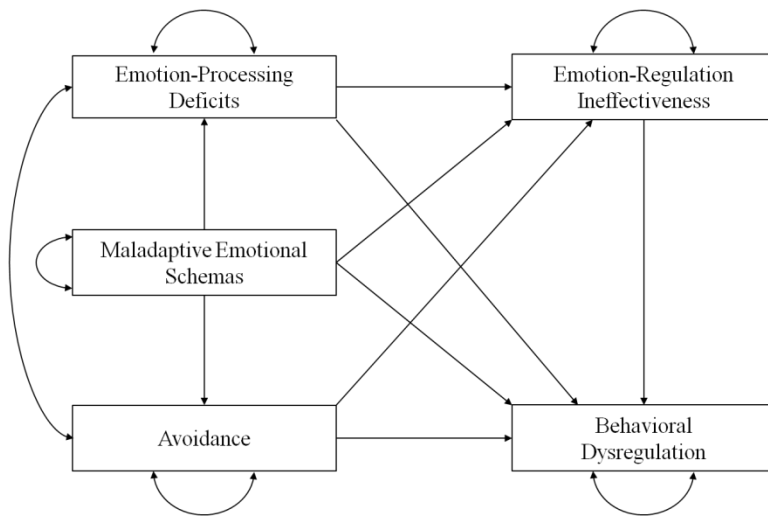
Figure 1: Proposed Theoretical Model

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 validated 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). The NMR is a 30-item self-report measure of expected 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 high confidence in emotion-regulation ability, whereas low scores reflect 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 was as-

Table 1: Participant Demographics

	Study 1		Study 2	
Demographic	n	N%	n	N%
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 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%

sessed 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 an 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. 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 in Kline, 2015.

Results

Transformations & Descriptive Statistics

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

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

Demographic Covariates

The relation of study variables to collected demographic variables was then examined through exploratory correlational and ANOVA analyses. Results of these analyses suggested significant relations between study variables and gender and race. With regard to gender, results suggested 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, results suggested significant differences 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 by conducting a 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 *Table 4* for correlation and standardized residuals in Study 1.

Study 2

Study 2 also utilized a cross-sectional design to investigate the associations between psychoemotional constructs. Study 2 aimed to both (a) 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.

Methods

Participants

Potential participants for Study 2 were recruited using online advertising in the New York City area. A total of 219 partici-

Table 2: Study 1 Descriptive Statistics

	M	SD	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)	2.41	0.68	0.13	-0.47

[a]Scores multiplied by -1
[b]Scores multiplied by 10

Table 3: Correlations & Covariances between Study 1 Variables

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

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

pants 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

Maladaptive Emotional Schemas. Endorsement of maladaptive emotional schemas was again assessed using the Leahy Emotional Schema Scale-II (LESS-II; Leahy, 2012).

Emotion-Processing Deficits. Participants' emotion-processing ability was again assessed using a computerized version of the Perception of Affect Task (PAT; Rau, 1988).

Avoidance-Based Regulation. Participants' tendencies to adopt avoidance-based regulation strategies was again assessed using the Cognitive-Behavioral Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004).

Behavioral Dysregulation & Emotion Regulation Ineffectiveness. Behavioral dysregulation was assessed using a computerized version of the Mirror Tracing Persistence Task (MTPT-C; Strong et al., 2003). The MTPT-C requires participants to trace a complex, geometric figure (e.g., star) using a computer mouse. 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. 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 geometric figure) 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 tracing task at any time. Persistence of goal-directed behavior was 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). Reported interference was interpreted as ineffectiveness of emotion regulation

Table 4: Study 1-Local Fit Statistics

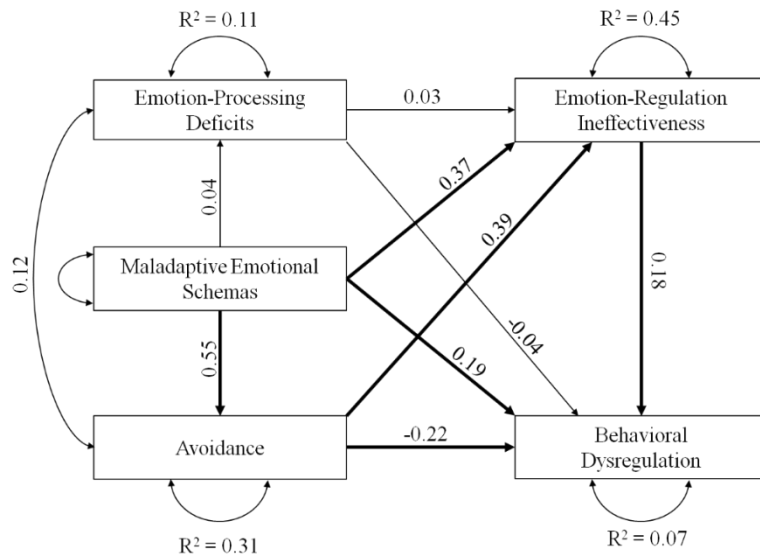|	LESS	PAT	CBAS	NMR	UPPS
			Correlation Residuals		
LESS	0.00				
PAT	0.00	0.00			
CBAS	0.00	-0.02	0.00		
NMR	0.00	-0.01	0.00	0.00	
UPPS	0.00	0.00	0.00	0.00	0.00
			Standardized Residuals		
LESS	0.00				
PAT	-0.02	-0.07			
CBAS	0.00	-0.34	0.00		
NMR	0.00	-0.14	-0.01	-0.01	
UPPS	0.00	0.05	0.01	0.01	0.00

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 5*.

during task completion.

Procedure

Potential participants for Study 2 were recruited using on-line 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 en-gagement and answer questions as needed. One attention-check question (i.e., "If you are paying attention, mark three for this question.") was included amidst other study questions to determine participant attention; participants failing this question (i.e., marking anything other than three) were ex-cluded 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

Table 5: 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
		Demographic Covariates			
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

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 cor-

relation 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 in Kline, 2015.

Results

Transformations & Descriptive Statistics

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

Table 6: Study 1 Descriptive Statistics

	M	SD	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

[a]Scores multiplied by -1
[b]Scores multiplied by 10
[c]Scores multiplied by .01

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 6*.

Correlation Analyses

Associations between study variables were investigated using correlational analyses. See *Table 7* for a summary of these analyses.

Demographic Covariates

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 suggested no significant associated 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, correlational analyses suggested significant associations between age and emotional schemas, $r = -0.23$, $p <; .01$, and between age and reported reliance on avoidance-based regulation strategies, $r = -0.15$, $p = .05$, such that older participants tended to endorse less maladaptive emotional schemas and to rely less on avoidance-based regulation strategies than younger participants.

Analyses also suggested significant differences across socioeconomic groups in participants' reported emotional schemas and emotion-processing abilities. Post-hoc analyses reflected that participants identifying as "Middle Class" reported signif-

icantly less maladaptive emotional schemas than participants identifying as "Lower Middle Class," $t(93) = 2.77$, $p = .01$, $d = -0.60$. No other significant socioeconomic differences in reported emotional schemas were observed. On the PAT (assessing emotion-processing abilities), participants identifying as "Lower Middle Class" earned lower PAT Total scores 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 earned lower PAT Total scores 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, χ^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 Table 8 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 dysreg-

Table 7: 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 8: Study 2 Local Fit Statistics

	LESS	PAT	CBAS	EmotionDys	MTPT-C
			Correlation Residuals		
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
			Standardized Residuals		
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
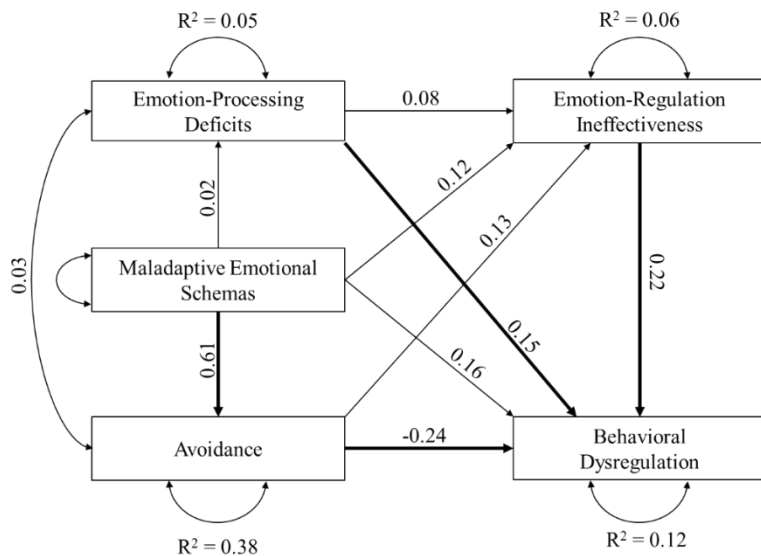
Figure 3: Study 2, Proposed Theoretical Model
*Because demographic correlates are not theoretically central to the proposed model, paths between demographic covariates and model variables are not listed. For details regarding these paths, see *Table 9*.

ulation, $\_R\_2 = 0.12$, 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, β = -0.24, $p <; .01$, similar to the unhypothesized suppression effect observed in Study 1. Unlike in Study 1, 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 17* for a summary of observed path coefficients and residual variances.

Discussion

The current research introduced and evaluated an integrative model of emotional schemas and psychoemotional functioning through two independent studies. Cumulatively, findings provide preliminary support for the proposed model. Four major findings were noted across studies. First, complex interrelations between psychoemotional factors suggest that few, if any, full mediational relationships exist between variables. Second, emotional schemas characterizing emotions as invalid, dangerous, unacceptable, and/or intolerable underlay various psychoemotional factors, particularly avoidant coping, emotion-regulation ineffectiveness, and behavioral dysregulation. Third, behavioral dysregulation was found to be markedly complex, stemming 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 these findings are detailed below.

Interrelations between psychoemotional factors

Across two, independent samples, results suggested complex interrelations between assessed psychoemotional factors. In Study 1, no full mediational relationships were noted; similarly, in Study 2, only one full mediational relationship was observed. 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 targeting any singular aspect of psychoemotional functioning may both (a) have "trickle-down" effects on de-emphasized psychoemotional factors through the complex interrelations between factors and (b) derive less benefit from the independent contributions of de-emphasized factors. It may therefore support treatments in adopting wholistic conceptualizations and treatment approaches for psychoemotional functioning. This is consistent with many third-wave therapies. For example, Dialectical Behavior Therapy includes training in mindfulness and acceptance as well as emotion-regulation ineffectiveness and behavioral dysregulation through its focus on development of "DBT Skills" (Linehan, 1993). This focus is particularly evident through the growing popularity of DBT Skills Groups as a standalone treatment for dysregulated behavior (Valentine, Bankoff, Poulin, Reidler, & Pantalone, 2015). Acceptance and Commitment Therapy has a similarly focused approach; the focus on experiential avoidance prioritizes both avoidant coping and emotional schemas as treatment targets (Hayes & Wilson, 1994).

Emotional Schemas in psychoemotional functioning

The current research also replicates and expands upon previous investigations into emotional schemas. Previous research suggests emotional schemas 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, results suggest maladaptive emotional schemas are closely associated with an avoidant coping style. Thus, individuals who perceive their emotions to be dangerous, uncontrollable, socially unacceptable, etcetera are likely to adopt strategies that distance themselves from emotional experiences and situations. Avoidant coping often serves a protective function by defending against painful experiences – in this case, emotions. Though protective in the short-term (the person avoids the discomfort of experiencing an emotion perceived as dangerous), avoidant coping 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 et al., 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, acceptable, controllable, etcetera. 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 va-

Table 9: Study 2, Proposed Theoretical Model Path Coefficients

Parameter	Unstandardized Coefficient	SE	z-value	p	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
			Covariates		
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
Errors Per → MTPT-C	-0.16	0.09	-1.75	.08	-0.12

lidity 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 that behavioral dysregulation – specifically, the inability to persist in goal-directed activity during times of high emotionality – is a complex construct, stemming from a combination of psychoemotional factors. 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 samples, behavioral dysregulation was most closely associated with emotion-regulation ineffectiveness

and avoidant coping. Some evidence suggested behavioral dysregulation was also associated with emotion-processing deficits and maladaptive emotional schemas. However, these associations were not replicated across samples and should be interpreted with caution.

Behavioral dysregulation & emotion-regulation ineffectiveness

Respondents were more likely to engage in goal-inconsistent behaviors when emotion-regulation strategies were ineffective and/or insufficient in managing emotional distress. In Study 1, this pattern occurred at the trait level (i.e., participants who reported chronic emotion-regulation ineffectiveness also reported higher engagement in dysregulated behavior); Study 2 suggested the pattern also occurred at the state level (i.e., participants who experienced emotional distress as disruptive were faster to prematurely terminate a distressing task). Be-

havioral dysregulation may therefore be the result of emotion-regulation burnout, serving to decrease emotional distress when other attempts at emotion regulation are unsuccessful and/or insufficient. These results are 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) and often serves a self-regulatory function (Klonksy, 2011; Wedig & Nock, 2010).

Behavioral dysregulation & coping style

Behavioral dysregulation also had a negative conditional association with avoidant coping after controlling for emotion-regulation ineffectiveness. This conditional association was noted in both Study 1 (assessing trait behavioral dysregulation) and Study 2 (assessing state behavioral dysregulation). Results suggest that so long as avoidant coping does not interfere with emotion-regulation effectiveness, it may have an adaptive effect on behavioral dysregulation.

These findings are inconsistent with popular conceptualizations of avoidance as maladaptive (e.g., Fledderus, Bohlmeijer, & Pieterse, 2010) and instead suggest avoidance may be adaptive in some 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. These findings provide further evidence to suggest that optimal psychoemotional functioning prioritizes flexibility in use of emotion-regulation strategies rather than individual, inherently adaptive strategies. Accordingly, future research may consider moving away from classifying regulation strategies as "adaptive" or "maladaptive" and instead focus on identifying patterns of fit between strategies and psychoemotional experience, situational demands, and personal goals.

Behavioral dysregulation, emotion processing, & emotional schemas

Behavioral dysregulation was also associated with emotion-processing deficits and maladaptive emotional schemas. However, these associations were not consistent across studies and measures. If replicated through future research, these findings would imply that effective interventions for behavioral dysregulation require a multi-targeted approach focused on a combination of emotion regulation, avoidance, emotion processing, and emotional schemas. This multi-targeted approach is consistent with various third-wave behavior therapies.

Emotion-Processing Deficits & psychoemotional functioning

In both samples, 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; Panksepp, 2006), future investigations may consider whether alternative measures of emotion processing are more adequately explained by the model.

Sociodemographic considerations

The proposed integrative model of psychoemotional functioning 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. In both studies, results also suggested psychoemotional functioning was significantly associated with sociodemographic characteristics, suggest-

ing 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, 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 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 of psychoemotional functioning.

Second, the current research relied heavily on use of self-report measures of psychoemotional functioning. Previous research has demonstrated various limitations to self-report methods, including biased response patterns stemming from research demand characteristics, self-presentation, and respondent insight (Paulhus & Vazire, 2005). Future 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 distress than in situations

of idiosyncratic stress (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

The current research proposes a theoretical model of psychoemotional functioning to organize and guide ongoing research into emotional experience and behavior. 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. Specifically, research may investigate the utility of the proposed model as a tool for organizing psychoemotional assessment, predicting treatment outcomes, and/or guiding intervention.

Conclusions

The proposed integrative model of psychoemotional functioning 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 play a key role in guiding psychoemotional experience and functioning. Third, behavioral dysregulation is a complex construct, which may stem 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. Nevertheless, results preliminarily suggest the model's potential viability as a clinically relevant

tool to guide and organize assessment, conceptualization, and treatment outcomes.

References

Adams, Z. W., Kaiser, A. J., Lynam, D. R., Charnigo, R. J., & Milich, R. (2012). Drinking motives as mediators of the impulsivity-substance use relation: Pathways for negative urgency, lack of premeditation, and sensation seeking. *Addictive Behaviors*, *37*(7), 848-855.

Anestis, M. D., Selby, E. A., Fink, E. L., & Joiner, T. E. (2007). The multifaceted role of distress tolerance in dysregulated eating behaviors. *International Journal of Eating Disorders*, *40*(8), 718-726.

Bardeen, J. R., Fergus, T. A., Hannan, S. M., & Orcutt, H. K. (2016). Addressing psychometric limitations of the Difficulties in Emotion Regulation Scale through item modification. *Journal of Personality Assessment*, *98*(3), 298-309.

Batmaz, S. & Özdel, K. (2015). Psychometric properties of the Turkish version of the Leahy Emotional Schema Scale-II. *Anadolu **Psikiyatri** Derg*, *16*, 23-30.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., . . . & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*(3), 230-241.

Brockmeyer, T., Holtforth, M. G., Krieger, T., Altenstein, D., Doerig, N., Friederich, H. C., & Bents, H. (2013). Ambivalence over emotional expression in major depression. *Personality and Individual Differences*, *54*(7), 862-864.

Carpenter, R. W., & Trull, T. J. (2013). Components of emotion dysregulation in borderline personality disorder: A review. *Current Psychiatry Reports*, *15*(335), 1-8.

Carvalho, J. P., & Hopko, D. R. (2011). Behavioral theory of depression: Reinforcement as a mediating variable between avoidance and depression. *Journal of Behavior Therapy and Experimental Psychiatry*, *42*(2), 154-162.

Catanzaro, S. J., & Mearns, J. (1990). Measuring generalized expectancies for negative mood regulation: Initial scale development and implications. *Journal of Personality Assessment*, *54*(3-4), 546-563.

Corrigan, P. W. (2001). Getting ahead of the data: A threat to some behavior therapies. *The Behavior Therapist*, *24*, 189-193.

Corstorphine, E. (2006). Cognitive–emotional–behavioural therapy for the eating disorders: Working with beliefs about emotions. *European Eating Disorders Review*, *14*(6), 448-461.

Delgado, M. R., Jou, R. L., LeDoux, J. E., & Phelps, E. A. (2009). Avoiding negative outcomes: tracking

the mechanisms of avoidance learning in humans during fear conditioning. *Frontiers in Behavioral Neuroscience, 3,* 72-80.

Ebner-Priemer, U. W., Houben, M., Santangelo, P., Kleindienst, N., Tuerlinckx, F., Oravecz, Z., . . . & Kuppens, P. (2015). Unraveling affective dysregulation in borderline personality disorder: A theoretical model and empirical evidence. *Journal of Abnormal Psychology*, *124*(1), 186-198.

Edwards, E. R., Micek, A., Mottarella, K., & Wupperman, P. (2017). Emotion ideology mediates effects of risk factors on alexithymia development. *Journal of Rational-Emotive and Cognitive Behavior Therapy*, *35*(3), 254-277.

Edwards, E. R. & Wupperman, P. (2019). Research on emotional schemas: A review of findings and challenges. *Clinical Psychologist, 23*(1), 3-14.

Feldner, M. T., Zvolensky, M. J., Eifert, G. H., & Spira, A. P. (2003). Emotional avoidance: An experimental test of individual differences and response suppression using biological challenge. _Behaviour_ Research and Therapy_, *41*(4), 403-411.

Feldner, M. T., Zvolensky, M. J., Stickle, T. R., Bonn-Miller, M. O., & Leen-Feldner, E. W. (2006). Anxiety sensitivity–physical concerns as a moderator of the emotional consequences of emotion suppression during biological challenge: An experimental test using individual growth curve analysis. _Behaviour_ Research and Therapy_, *44*(2), 249-272.

Fledderus, M., Bohlmeijer, E. T., & Pieterse, M. E. (2010). Does experiential avoidance mediate the effects of maladaptive coping styles on psychopathology and mental health? *Behavior Modification*, *34*(6), 503-519.

Hayes, S. C., Masuda, A., Bissett, R., Luoma, J., & Guerrero, L. F. (2004). DBT, FAP, and ACT: How empirically oriented are the new behavior therapy technologies? *Behavior Therapy*, *35*(1), 35–54.

Hayes, S. C., Villatte, M., Levin, M., & Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology*, *7*, 141–168.

Hayes, S. C., & Wilson, K. G. (1994). Acceptance and commitment therapy: Altering the verbal support for experiential avoidance. *The Behavior Analyst*, *17*(2), 289–303.

Izard, C. E. (2010). The many meanings/aspects of emotion: Definitions, functions, activation, and regulation. *Emotion Review*, *2*(4), 363-370.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, *4*(1), 33-47.

Kahl, K. G., Winter, L., & Schweiger, U. (2012). The third wave of cognitive behavioural therapies. *Current Opinion in Psychiatry*, *25*(6), 522–528.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York: Guilford Press.

Klonsky, E. D. (2011). Non-suicidal self-injury in United States adults: Prevalence, sociodemographics, topography and functions. *Psychological Medicine*, *41*(9), 1981-1986.

Koerner, K. & Linehan, M. (2003). Validation principles and strategies. In W. O'Donohue, J. E. Fisher, & S. C. Hayes (Eds.) *Cognitive behavior therapy: Applying empirically-supported techniques in your practice* (pp. 456-462)_. _Hoboken, NJ: John Wiley & Sons.

Krause, E. D., Mendelson, T., & Lynch, T. R. (2003). Childhood emotional invalidation and adult psychological distress: The mediating role of emotional inhibition. *Child Abuse & Neglect*, *27*(2), 199-213.

Krause, E. D., Robins, C. I., & Lynch, T. R. (2000). A mediational model relating sociotropy, ambivalence over emotional expression, and disordered eating. *Psychology of Women Quarterly*, *24*(4), 328-335.

Kret, M. E., & Ploeger, A. (2015). Emotion processing deficits: A liability spectrum providing insight into comorbidity of mental disorders. *Neuroscience & Biobehavioral Reviews*, *52*, 153-171.

Lane, R. D., Lee, S., Reidel, R., Weldon, V., Kaszniak, A., & Schwartz, G. E. (1996). Impaired verbal and nonverbal emotion recognition in alexithymia. *Psychosomatic Medicine*, *58*(3), 203-210.

Lane, R. D., Sechrest, L., Riedel, R., Shapiro, D. E., & Kaszniak, A. W. (2000). Pervasive emotion recognition deficit common to alexithymia and the repressive coping style. *Psychosomatic Medicine*, *62*(4), 492-501.

Leahy, R. L. (2002). A model of emotional schemas. *Cognitive and Behavioral Practice*, *9*, 177–190.

Leahy, R. L. (2012). *Leahy Emotional Schema Scale-II*. Available at: http://www.cognitivetherapynyc.com/LESS2.pdf.

Leahy, R. L. (2015). *Emotional schema therapy*. New York,

NY: Guilford Publications.

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: The Guilford Press.

Linehan, M. M. (1997). Validation and psychotherapy. In A. C. Bohart & L. S. Greenberg (Eds.), *Empathy reconsidered: New directions in psychotherapy* (pp. 353-392). Washington, DC: American Psychological Association.

Lynam, D. R., Smith, G. T., Whiteside, S. P., & Cyders, M. A. (2006). *The UPPS-P: Assessing five personality pathways to impulsive behavior*. West Lafayette, IN: Purdue University.

Manser, R., Cooper, M., & Trefusis, J. (2012). Beliefs about emotions as a metacognitive construct: Initial development of a self-report questionnaire measure and preliminary investigation in relation to emotion regulation. *Clinical Psychology and Psychotherapy*, *19*(3), 235–246.

McHugh, R. K., Daughters, S. B., Lejuez, C. W., Murray, H. W., Hearon, B. A., Gorka, S. M., & Otto, M. W. (2011). Shared variance among self-report and behavioral measures of distress intolerance. *Cognitive Therapy and Research*, *35*(3), 266-275.

Mitmansgruber, H., Beck, T. N., Höfer, S., & Schüßler, G. (2009). When you don't like what you feel: Experiential avoidance, mindfulness and meta-emotion in emotion regulation. *Personality and Individual Differences*, *46*(4), 448–453.

Mongrain, M., & Vettese, L. C. (2003). Conflict over emotional expression: Implications for interpersonal communication. *Personality and Social Psychology Bulletin*, *29*(4), 545-555.

Moulds, M. L., Kandris, E., Starr, S., & Wong, A. C. (2007). The relationship between rumination, avoidance and depression in a non-clinical sample. _Behaviour__ Research and Therapy_, *45*(2), 251-261.

Müller, J., Bühner, M., Ziegler, M., & Şahin, L. (2008). Are alexithymia, ambivalence over emotional expression, and social insecurity overlapping constructs? *Journal of Psychosomatic Research*, *64*(3), 319-325.

Naragon-Gainey, K. (2010). Meta-analysis of the relations of anxiety sensitivity to the depressive and anxiety disorders. *Psychological Bulletin*, *136*(1), 128-150.

Norman, E., & Furnes, B. (2016). The concept of "metaemotion": What is there to learn from research on metacognition? *Emotion Review*, *8*(2), 187–193.

O'Donohue, W., Snipes, C., & Soto, C. (2016). The design, manufacture, and reporting of weak and pseudo-tests: The case of ACT. *Journal of Contemporary Psychotherapy*, *46*(1), 37-40.

Olatunji, B. O., & Wolitzky-Taylor, K. B. (2009). Anxiety sensitivity and the anxiety disorders: A meta-analytic review and synthesis. *Psychological Bulletin*, *135*(6), 974-999.

Öst, L. G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. _Behaviour__ Research and Therapy_, *46*(3), 296–321.

Ottenbreit, N. D., & Dobson, K. S. (2004). Avoidance and depression: The construction of the Cognitive–Behavioral Avoidance Scale. _Behaviour__ Research and Therapy_, *42*(3), 293-313.

Panksepp, J. (2006). Emotional endophenotypes in evolutionary psychiatry. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *30*(5), 774-784.

Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.) *Handbook of research methods in personality psychology* (pp. 224-239). New York: Guilford Press.

Quinton, S., & Wagner, H. L. (2005). Alexithymia, ambivalence over emotional expression, and eating attitudes. *Personality and Individual Differences*, *38*(5), 1163-1173.

Pearson, C. M., Combs, J. L., Zapolski, T. C., & Smith, G. T. (2012). A longitudinal transactional risk model for early eating disorder onset. *Journal of Abnormal Psychology*, *121*(3), 707-718.

Racine, S. E., Keel, P. K., Burt, S. A., Sisk, C. L., Neale, M., Boker, S., & Klump, K. L. (2013). Exploring the relationship between negative urgency and dysregulated eating: Etiologic associations and the role of negative affect. *Journal of Abnormal Psychology*, *122*(2), 433-444.

Rau, J. C. (1988). A normative study of the perception of affect task. *Thesis*.

Rau, J. C. (1992). Perception of verbal and nonverbal affective stimuli in complex partial seizure disorder. *Dissertation*.

Rosenthal, M. Z., Neacsiu, A. D., Geiger, P. J., Fang, C., Ahn, R., & Larrauri, J. (2016). Emotional reactivity to personally-relevant and standardized sounds in borderline personality disorder. *Cognitive Therapy and Research*, *40*(3), 314-327.

Sánchez, F. M., Larrieux, M. L. B., Rovira, D. P., & Ball, D. C. (2013). Beliefs about the effects of social sharing of emotion in alexithymia. *Psicothema*, *25*(2), 179-184.

Selby, E. A., & Joiner, T. E. (2009). Cascades of emotion: The emergence of borderline personality disorder from emotional and behavioral dysregulation. *Review of General Psychology*, *13*(3), 219-229.

Simpson, T., Jakupcak, M., & Luterek, J. A. (2006). Fear and avoidance of internal experiences among patients with substance use disorders and PTSD: The centrality of anxiety sensitivity. *Journal of Traumatic Stress*, *19*(4), 481-491.

Spokas, M., Luterek, J. A., & Heimberg, R. G. (2009). Social anxiety and emotional suppression: The mediating role of beliefs. *Journal of Behavior Therapy and Experimental Psychiatry*, *40*(2), 283-291.

Stewart, S. H., Zvolensky, M. J., & Eifert, G. H. (2001). Negative-reinforcement drinking motives mediate the relation between anxiety sensitivity and increased drinking behavior. *Personality and Individual Differences*, *31*(2), 157-171.

Stewart, S. H., Zvolensky, M. J., & Eifert, G. H. (2002). The relations of anxiety sensitivity, experiential avoidance, and alexithymic coping to young adults' motivations for drinking. *Behavior Modification*, *26*(2), 274-296.

Strong, D. R., Lejuez, C. W., Daughters, S., Marinello, M., Kahler, C. W., & Brown, R. A. (2003). The computerized mirror tracing task, version 1. *Unpublished manual*.

Totterdell, P., & Leach, D. (2001). Negative mood regulation expectancies and sports performance: An investigation involving professional cricketers. *Psychology of Sport and Exercise*, *2*(4), 249-265.

Valentine, S. E., Bankoff, S. M., Poulin, R. M., Reidler, E. B., & Pantalone, D. W. (2015). The use of dialectical behavior therapy skills training as stand-alone treatment: A systematic review of the treatment outcome literature. *Journal of Clinical Psychology*, *71*(1), 1-20.

Wedig, M. M., & Nock, M. K. (2010). The functional assessment of maladaptive behaviors: A preliminary evaluation of binge eating and purging among women. *Psychiatry Research*, *178*(3), 518-524.

Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalized anxiety disorder. _Behavioural__ and Cognitive Psychotherapy_, *23*(3), 301.