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FAMILY INVALIDATION AND COGNITIVE FLEXIBILITY WITHIN ASIAN YOUNG ADULTS

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FAMILY INVALIDATION AND COGNITIVE FLEXIBILITY WITHIN
ASIAN YOUNG ADULTS

JENNIFER LEE, M.S.

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MAJOR DIVISION: PSYCHOLOGY

SPONSORING COMMITTEE:

Jill Rathus, Ph.D.

DATE

Eva Feindler, Ph.D.

DATE

Michelle Chung, Psy.D.

DATE

Abstract

The concept of the “invalidating environment” is a core construct of Dialectical Behavior Therapy (DBT), serving as a defining component of Linehan’s biosocial theory (1993a). In this context, the understanding and practice of validation helps to strengthen the relationship between young adults and their caregivers. Research proposes that invalidation increases emotion dysregulation and impairs cognitive processing ability (Martel and Fuchs, 2017). Cognitive flexibility, which allows individuals to adapt to distressing, changing environments, seems to play an important role in emotion regulation. Cognitive flexibility within Asian children has been studied in the context of family conflict and parental rejection (Ahn, Kim, and Park, 2008). However, there is to date no research regarding cognitive flexibility as it relates to the DBT biosocial model, the invalidating environment, and emotion regulation. As Asian youth are highly susceptible to invalidation (Hahm, Gonyea, Chiao, Koritsanszky, 2014; Keng and Soh, 2018) and young adulthood is a period of onset for possible trajectories toward severe psychopathology (Martel & Fuchs, 2017), understanding the relationship between an invalidating environment and cognitive flexibility within an Asian young adult community could be important in suggesting points of intervention and revealing a possible mechanism regarding the relationship between an invalidating environment and the occurrence of emotion dysregulation. The present study evaluated the relationship between perceived parental validation and cognitive flexibility in a sample of 88 Asian young adults. Results revealed that in contrast to *appraisal and coping flexibility*, only *cognitive control over emotion* was negatively correlated with *invalidation* ($r(88) = -0.264, p < 0.01$). We also found *cognitive control over emotion* to be a mediator between *invalidation* and *emotion dysregulation* ($p = 0.008$). Study implications include targeting specific cognitive control strategies directly to potentially recover from perceived parental invalidation and to manage emotion dysregulation.

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Our lives and interactions with the world are colored by our emotions. Emotions can imbue our favorite memories with nuance and strength while our greatest fears can disrupt controlled behavior or coopt our attention. Emotions play a strong role in our ability to evaluate, assess, and adjust to the environment. Emotions also impact our cognitions and have a significant effect on our behavior (Linehan, 2015a). A salient aspect of emotions important for mental health is emotion regulation. Emotion regulation is defined as “the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998, p. 275). Those who lack emotion regulation skills or use maladaptive coping skills are more likely to show heightened emotional reactivity (Gross and Levenson, 1997; Hayes, Strosahl, and Wilson, 1999) and psychopathology (Aldao, Nolen-Hoeksema, and Schweizer, 2010; Southam-Gerow and Kendall, 2002).

The Biosocial Model

From the perspective of the biosocial model of the development of borderline personality disorder (BPD; Crowell, Beauchaine, and Linehan, 2009; Linehan, 1993a), emotion dysregulation is a mechanism that underlies extreme behaviors, mood instability, identity disturbance and relationship instability (Hope and Chapman, 2019). Validating and invalidating responses from the environment are important in this biosocial model due to their impact on emotional reactivity and emotion regulation (Linehan, 1993a; Shenk & Fruzzetti, 2011). Linehan’s model states that the symptoms of BPD develop due to a transactional relationship between pre-existing emotional vulnerability and a pervasively invalidating environment. According to Linehan (1993a), an invalidating environment is one in which one’s personal experiences are punished or trivialized as erratic, inappropriate, and extreme. The pain or factors contributing to an individual’s distress are pervasively disregarded, corrected, or dismissed

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regardless of the actual validity of the individual's behavior. The biosocial model proposes that the invalidating responses have a significant impact on emotional reactivity by increasing emotion dysregulation, which impedes the ability to learn or process new information, and increases behavioral dyscontrol as a response to emotion dysregulation or as an attempt to regulate, or by decreasing the ability to recall or use skills for regulating emotions.

Invalidation

Prior research finds that invalidation has strong impacts on mental health. The biosocial theory shows that two childhood factors, including childhood emotional vulnerability and environmental invalidation are biosocial precursors to BPD symptoms (Sauer and Baer, 2010). A longitudinal study revealed that young adults exposed to invalidating responses reported higher levels of negative affect, heart rate, and skin conductance over time when compared to individuals who were exposed to validating responses (Shenk and Fruzzetti, 2011). Moreover, experiences of invalidation lead to emotion dysregulation and impair cognitive processing (Linehan, 1993a). Individuals' invalidating environments hold a pattern similar to high "expressed emotion," or criticism and over-involvement that is found in families of depressed and schizophrenics with high relapse rates (Leff & Vaughn, 1985; Linehan, 1993a). The developmental consequences of a history of an invalidating environment include failure to recognize and label emotions, a key factor in emotion regulation strategies; failure to trust internal, emotional experiences, especially if emotions are not supported by observable events (Crowell, Beauchaine, and Linehan, 2009); as well as failure to learn how to change emotions or how to solve problems. While invalidating environments intermittently reinforce extreme expressions of emotions, they simultaneously punish emotional expression, informing the child that emotional displays should be dealt with internally without parental support (Crowell,

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Beauchaine, and Linehan, 2009). Thus, the child wavers between extreme emotional lability and emotional inhibition, as seen in the diagnosis of Borderline Personality Disorder (Linehan, 1993). The individual thus learns to experience emotions such as shame, guilt, fear, or hopelessness associated with their emotions in an invalidating environment, instead of using emotions as important sources of information.

The heightened emotional arousal that occurs when one's internal experiences are invalidated results in tunnel vision and emotion-driven actions, rather than adapting to situations flexibly and assessing for alternative options of behaviors or thoughts (Linehan, 1993a). Regulating emotions during that time is difficult, especially for one who has limited emotion regulation skills and uses problematic behaviors to reduce such emotional reactivity (Brain, Haines, and Williams, 1998; Nock and Mendes, 2008; Shenk & Fruzzetti, 2011). Shenk and Fruzzetti purport that validating responses can be conducive to regulating individual emotional reactivity, even during a distressing situation (2011). Linehan stated, "the alternative to seeking validation from the environment is simply to change or at least to modulate one's emotional responses in accord with environmental expectations; the inability to regulate affect, however, precludes such a solution for the borderline individual." (1993a, p. 72-73). Children are unable to learn how to successfully control their emotional reactions, "tolerate distress or to form realistic goals and expectations." (Linehan, 1993a, p. 51). Moreover, Fruzzetti and his colleagues (2005) stated that high levels of emotional and psychophysiological arousal interfere with cognitive processing in general in an invalidating environment, which is more than enough to influence an individual's ability to focus and become aware of one's thoughts and feelings. The impact of invalidation on emotion regulation capacity with reduced awareness, focus, and ability to manage emotions and behaviors, relates to the notion of cognitive flexibility.

Cognitive Flexibility

During stressful situations, certain coping methods can be more adaptive than others, but Matheson and Anisman found that implementation of any methods is highly situation-dependent (2003). As coping methods shift across situations, the ideal strategy to cope during stressful situations involves flexibility (Cheng et al., 2014). In fact, cognitive flexibility consists of alternating these cognitive or behavioral strategies to adjust to stressful environmental demands. Cognitive flexibility is defined as the ability to recognize and adapt to various situational demands, shift mindsets or behavioral repertoires when one's social or personal functioning are compromised, and maintain balance among life domains (Kashdan and Rottenberg, 2010). Various accounts of cognitive flexibility include closely related constructs, such as psychological flexibility (Kashdan and Rottenberg, 2010) or cognitive control (Gabrys et al., 2018). Linehan also stated that "cognitive style" refers to various modes of information processing, including cognitive flexibility (1993). However, the terms, "cognitive flexibility" and "psychological flexibility" are essentially used interchangeably and for the purposes of this study, we will use the common definition relating to the Cognitive Control and Flexibility Questionnaire (CCFQ; Gabrys, Tabri, Anisman, and Matheson, 2018), which measures cognitive control processes and the complex processes involved in approaching a situation from multiple perspectives, regulating emotions through reappraisal, and using coping strategies. To emphasize this point, Kashdan and Rottenberg's concept indicates that as a key ingredient to psychological health, psychological flexibility serves multiple processes that unfold over time, including how one adapts to fluctuating situational demands, reconfiguring mental resources, shifting perspective, and balancing competing desires, needs, and life domains (2010). In addition, psychological flexibility facilitates goal-directed behaviors (including creativity, problem-solving, multi-

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tasking, and decision-making; Dajani and Uddin, 2015; Gabrys et al., 2018; Ionescu, 2012; Rolls, 2000), allowing individuals to adapt in continuously changing or distressing environments (2010). The authors state that psychological flexibility integrates connections between individuals and their environmental contexts (2010). Prior studies found cognitive flexibility to greatly affect problem-solving and decision-making (Cañas et al., 2003; Gabrys, et al., 2018; Hare et al., 2009; Isen, 2008).

Cognitive Flexibility and Emotion Regulation

The role of cognitive flexibility has been implicated in emotion regulation and evidence shows difficulties in emotion regulation manifest in psychopathology (Gabrys et al., 2018). Literature found that low levels of cognitive flexibility are correlated with presence of mood and anxiety disorders (Deak, 2003, Stemme, et al., 2007; Moore and Malinowski, 2009). Additional empirical evidence found individuals with Borderline Personality Disorder (BPD) or BPD features perform more poorly in cognitive flexibility than healthy controls (Ruocco, 2005). Considering that low levels of cognitive flexibility relate to greater psychopathology, it is important to note the converse, that increased cognitive flexibility has been found to be associated with enhanced adjustment and fewer psychopathology symptoms (Ruocco, 2005). In terms of emotional situations, Malooly and colleagues indicated that “the ability to flexibly attend to and disengage from emotional aspects of a situation or a stimulus” could incorporate flexibility processes (2013). Specifically, studies have found that cognitive control is significantly associated with reappraisal process (Ochsner and Gross, 2005; Ochsner et al., 2012) and that due to this reappraisal process, shifting ‘cognitive sets’ cognitive flexibility or the lack thereof may manifest during adverse situations (Gabrys et al., 2018). Similarly, Zaehring and colleagues suggested that cognitive flexibility allows for shifts between implementation and

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maintenance of new cognitive reappraisals (2018). Due to the likelihood of negative emotional reactivity accompanying stressful situations, and due to the fact that shifting focus on non-mood-dependent goals is a key component in emotion regulation ability (Linehan, 1993a), cognitive flexibility may be an important factor in the ability to regulate emotions. Several studies found a relationship between emotion regulation and cognitive flexibility. One study found that application of emotion regulation strategies during computerized learning promoted optimistic emotions as well as higher cognitive flexibility (Malekzadeh, Mustafa, and Lahsasna, 2015). Recently, Arici-Ozcan and colleagues stated there is much evidence for a positive correlation between cognitive flexibility and positive emotions (Fredrickson, 2003; Goschke and Bolte, 2014; Hirt, Devers, and McCrea, 2008; Lin, Tsai, Lin, and Chen, 2014; Yang, Yang, and Isen, 2013) and their results showed individuals with higher degrees of cognitive flexibility experienced less difficulty in emotion regulation (2019). Consistently, other findings indicated flexible emotion regulation, which Kobylńska and Kusev defined as the ability to effectively regulate emotions by applying different emotion regulation strategies in different situations depending on one's personality traits and situation, may be related to cognitive flexibility (2019). Moreover, given that invalidating responses impede cognitive processing, lower cognitive flexibility might prove a potential mechanism through which the invalidating environment leads to increased emotion dysregulation. It also might be an important target for intervention.

Invalidation Among Asian Families

Although invalidation is common among many families, prior studies report Asian adolescents and young adults receive a particularly high level of invalidation (Ahn, Kim, and Park, 2008; Hahm, Gonyea, Chiao, and Koritsanszky, 2014). Findings suggest that there are positive associations between BPD symptoms and childhood invalidation within Asian

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multicultural societies influenced by Confucius values as well as other Asian heritages (Keng and Wong, 2017). Prior literature focused more on parental abuse and emotional neglect in regard to severe psychopathology. One study found Chinese individuals who received a BPD diagnosis compared to individuals without personality disorders reported higher levels of parental, physical, emotional, and sexual abuse (Huang et al., 2012). A second study reported BPD symptomatology as positively associated with childhood emotional and physical neglect (Keng and Soh, 2018; Zhang et al., 2012). Closer to the context of the biosocial model, Keng and Wong (2017) found that increased level of self-compassion, a correlate of increased psychological health and adaptive emotion regulation, predicted fewer BPD symptoms across high levels of childhood invalidation in Singaporean young adults. Yet, a paucity of research investigates components of the biosocial theory in the context of Asians.

As cognitive flexibility is negatively associated with depression, anxiety, and other psychopathologies (Gabrys et al., 2018), high levels of invalidation within Asian families are positively associated with depression and other mental health symptoms (Keng & Soh, 2018). No work, however, has directly focused on Asian family invalidation and cognitive flexibility. A prior study focused on parental-child conflict and its relationship with cognitive flexibility (Ahn, Kim, & Park, 2008). The authors defined cognitive flexibility as a person's awareness, willingness, and self-efficacy to think about other options when addressing conflicts. By being cognitively flexible, people can adapt to changes and minimize conflicts (Ahn, Kim, & Park, 2008; Martin and Rubin, 1995). Ahn and colleagues hypothesized cognitive flexibility as a possible moderating variable between cultural values gap with parents and their perceived parent-child conflicts (2008). In another study, findings showed indirect coping that involved changing oneself rather than the situation was correlated with increased family conflict and

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psychological distress (Lee and Liu, 2001). Kim (2002) found use of higher cognitive control was associated with decreased reported distress regarding stressful situations. In Gabrys and colleagues' research, they found cognitive flexibility was involved with reappraisal, an adaptive cognitive emotion regulation strategy (2018). As John and Gross (2004) posited that use of reappraisal affects emotional, social, and cognitive domains and that this emotion regulation strategy can have a significant impact on adjusting emotional experience or expression to situational demands (Thompson and Meyer, 2007) as well as the finding that cognitive reappraisal is negatively correlated with maternal invalidation (Warner, Hernandez, and Veilleux, 2020), there is reason to believe cognitive flexibility may be correlated with parental invalidation.

According to Grove and Crowell (2019), overprotective and over-controlling parenting styles relate to invalidation. Parental control or parenting behaviors defined by shaping contingencies are enforced by overprotective, overly critical, and intrusive parenting behaviors, which are linked to internalizing and externalizing disorders (Barber et al., 1994; Kuppens et al., 2013; Nanda, Kotchick, and Grover, 2012) as well as self-harm (Wedig and Nock, 2007). Furthermore, Grove and Crowell (2019) state that parental psychological control may be relevant to BPD development. As parental invalidation is a prominent and pervasive issue in Asian populations (Chou and Chou, 2018; Shariff, 2009) and this environmental influence is found to continue beyond adolescence (Padilla-Walker and Nelson, 2012), cognitive flexibility is a relevant construct to further investigate within Asian young adults. There is a dearth of evidence that investigates whether invalidation is associated with cognitive flexibility within the Asian youth population, a topic worth exploring given how Asian culture's typical values, including interdependence, emotion control, and hierarchy (Ford and Mauss, 2015; Kim, Atkinson,

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Umemoto, 2001) might again, suggest Asians experience high level of invalidation (Keng & Wong, 2017). Given filial piety's importance in Asian culture, youth are expected to submit to the collective expectation in their family to promote harmony and in Asian cultural value systems where control and critical parenting styles are emphasized (Chao and Aque, 2009; Fung 1999; Lau and Cheung, 1987; Markus and Kitayama, 1991; Olsen et al., 2002; Park et al., 2010). Thus, examining how parental invalidation may be related to cognitive flexibility may help advance research regarding targeted interventions used in invalidating Asian families. As young adulthood is a period of onset for trajectories toward severe psychopathology, such as BPD (Keng & Wong, 2017) or self-harm and suicidal behaviors (Hahm, Gonyea, Chiao, Koritsanszky, 2014), the need to study the Asian young adult population becomes relevant.

The Present Study

The present study will assess whether invalidation is related to cognitive flexibility in an Asian population. Although we recognize family invalidation to be common, there is a considerable lack of research on the impact of family invalidation within Asian communities. We will also see whether cognitive flexibility mediates the relationship between invalidation and emotion dysregulation. Findings may contribute to understanding a mechanism through which invalidation may lead to emotion dysregulation (i.e., cognitive flexibility). Understanding the impact of invalidation on cognitive flexibility in the context of Linehan's biosocial theory (1993a) may have implications for targeting parental invalidation in Asian families, and cognitive flexibility within Asian youth. This study proposes to evaluate whether invalidation is associated with cognitive flexibility within Asian young adults. We hypothesize that 1) Perceived parental invalidation will be positively correlated with emotion dysregulation, given that the biosocial theory suggests experiences of invalidation lead to emotion dysregulation

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(Linehan, 1993a); 2) Perceived parental invalidation will be negatively correlated with cognitive flexibility as defined by negative correlations with each subscale of the Cognitive Control and Flexibility Questionnaire (CCFQ); 3) Cognitive control over emotion, subscale of CCFQ will be negatively correlated with emotion dysregulation and 4) Appraisal and coping flexibility, subscale of CCFQ will be negatively correlated with emotion dysregulation, since cognitive flexibility has been found to be key in one's ability to regulate emotions (Linehan, 1993a); and 5) Cognitive flexibility (as defined by the two subscales on the CCFQ) will mediate the relationship between invalidation and emotion dysregulation, particularly since empirical findings show cognitive flexibility is associated with emotion regulation (Gabrys et al., 2018; Arici-Ozcan, and Arslan, 2019) and invalidation increases emotion dysregulation and impairs cognitive processing (Martel & Fuchs, 2017);

Method

Participants

A total of 150 participants were recruited from a Facebook group created by the Asian Mental Health Collective called Subtle Asian Mental Health. Survey responses were collected and labeled with ID numbers to keep participant identification anonymous and materials were de-identified. Survey responses were filtered for inclusion criteria (at least one caregiver and between the ages of 18 to 25). After filtering, a total of 88 participants remained (mean +/- standard deviation (SD) age: 22.31 +/- 2.06; 77 female, 10 Male, 1 Non-Binary). Demographic information on the participants is included in Figure 1. All procedures were approved by the Long Island University Post Institutional Review Board.

Measures

Demographic form

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A demographic questionnaire (see A1) was administered to the participants and included questions about age, gender, race/ethnicity, nation in which participant was born, level of education, current household status, and caregiver(s) role(s) in the participant's life. The survey also included questions on whether participants had any psychological diagnosis or symptoms, any prior history of therapy or ongoing treatment, and any DBT skills gained from DBT or DBT-informed treatment.

Perceived Invalidation of Emotion Scales (PIES; see A2)

Perceived invalidation was measured using the Perceived Invalidation of Emotion Scales (PIES; Zielinski and Velleux, 2018). This scale is composed of 10-items that examine the current level of emotional invalidation, as Zielinski and Velleux (2018) describe emotion invalidation to be central to manifestation of psychopathology, especially Borderline Personality Disorder (BPD; Linehan, 1993). The creators of this scale treated emotional invalidation as a general environmental characteristic, rather than using it in any particular relationship, such as assessing emotional invalidation by a romantic partner (2018) or how parental behavior was experienced by the respondent in the past. Respondents were asked to reflect on their experiences with how others have responded to their emotions during the past month. For the purposes of this study, the scale was modified such that "others" was replaced with "my parent(s) or caregiver(s)". Items were rated on a 5-point Likert scale ranging from 1 (Almost never; 0–10%) to 5 (Almost always; 91– 100%). Responses were averaged to create a mean emotion invalidation score and these scores ranged from 1 to 5. The higher the score, the more perceived emotion invalidation the participant felt. Internal consistency was excellent with Cronbach's alpha = .91 and .93 at Time 1 (baseline) and Time 2 (after one month) respectively. Test-retest reliability showed a moderately large correlation ($r = .67, p < .01$) between baseline and post-one month scores.

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Convergent validity found modest convergence between PIES and two childhood invalidation measures ($r = .18, p = .02$ for ICES; $r = .27, p < .01$ for SES). PIES had good concurrent validity for variables related to psychopathology (emotional distress and dysregulation) and diverged from measures that were not expected to be associated with emotion invalidation, such as number of social supports and openness. PIES showed high predictive validity, indicating present symptoms of borderline personality features or emotional distress are a strong predictor of future symptoms and that emotionally invalidating experiences may exacerbate the emotional distress individuals may be feeling.

The Cognitive Control and Flexibility Questionnaire (CCFQ; see A3)

Cognitive flexibility was measured using The Cognitive Control and Flexibility Questionnaire (CCFQ; Gabrys, Tabri, Anisman, and Matheson, 2018), an 18-item self-report measuring two factors that make up cognitive flexibility, *cognitive control over emotion* and *appraisal and coping flexibility*. The *cognitive control over emotion* dimension was composed of items that assess cognitive control processes such as attention, inhibition, and set-shifting that could be helpful in regulating negative thoughts and emotions elicited during a distressing situation. The *appraisal and coping flexibility* factor measured more complex processes related to changes of appraisals, including approaching a situation from multiple perspectives, regulating emotions through reappraisal processes, and utilizing coping strategies. Participants responded to each item on the measure using a Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). This questionnaire showed high internal reliability (Cronbach's alpha = .90, .89, .90, .93) for these two dimensions within a student and community sample respectively. There was also a moderate overlap between these two dimensions ($r = .49$) among a student sample and a higher overlap ($r = .61$) among a community sample, indicating good construct validity. Scale scores for

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each cognitive control over emotion dimension were calculated by reverse scoring appropriate items and then by obtaining the mean rating for items comprising each dimension. Scale scores for each appraisal and coping flexibility were calculated by obtaining the mean rating for the sum of item scores under its dimension. Averaged scores ranged from 1 to 7 for each subscale. Item numbers 2, 4, 7, 8, 11, 14, 15, 16, and 18 are under the subscale, *Cognitive control over emotion*, while item numbers 1, 3, 5, 6, 9, 10, 12, 13, and 17 are under the subscale, *Appraisal and coping flexibility* (See Table 1). Greater scores on both subscales of the CCFQ suggested that the individual has more cognitive flexibility. Gabrys and colleagues indicated individuals may appraise the situation as more controllable rather than of perceived threat (2018).

Table 1

Items in Cognitive Control and Flexibility Questionnaire (CCFQ)

Cognitive control over emotion

- 2. I feel like I lose control over my thoughts and emotions. *
- 4. It's difficult to let go of intrusive thoughts or emotions. *
- 7. I find it easy to set aside unpleasant thoughts or emotions.
- 8. It is easy for me to ignore distracting thoughts.
- 11. I get easily distracted by upsetting thoughts or feelings.*
- 14. I can remain in control of my thoughts and emotions.
- 15. I have a hard time managing my emotions.*
- 16. My thoughts and emotions interfere with my ability to concentrate.*
- 18. It's hard for me to shift my attention away from negative thoughts or feelings.*

Appraisal and coping flexibility

- 1. I weigh out my options before choosing how to take action.
- 3. I approach the situation from multiple angles.
- 5. I consider the situation for multiple viewpoints before responding.
- 6. I take the time to think of several ways to best cope with the situation before acting.
- 9. I can easily think of multiple coping options before deciding how to respond.
- 10. I take the time to see things from different perspectives before reacting.
- 12. I take the time to think of more than one way to resolve the problem.
- 13. I control my thoughts and feelings by putting the situation into context.
- 17. I manage my thoughts or feelings by reframing the situation.

Difficulties in Emotion Regulation Scale – Short Form (DERS-SF; see A4)

DERS-SF (Kaufman et al., 2015) is an abridged version of the DERS (Gratz and Roemer, 2014), consisting of 18 items that load onto four dimensions of emotion regulation: awareness and understanding of emotions; acceptance of emotions; the ability to engage in goal-directed behavior and refrain from impulsive behavior when experiencing negative emotions; and access to emotion regulation strategies seen as effective. Overall, the measure has six subscales: (1) Nonacceptance of Emotional Responses (e.g., “When I’m upset, I feel guilty for feeling that way”), (2) Difficulties Engaging in Goal-Directed Behavior (e.g., “When I’m upset, I have difficulty concentrating”), (3) Impulse Control Difficulties (e.g., “When I’m upset, I become out of control”), (4) Lack of Emotional Awareness (e.g., “I pay attention to how I feel”), (5) Limited Access to Emotion Regulation Strategies (e.g., “When I’m upset, it takes me a long time to feel better”), and (6) Lack of Emotional Clarity (e.g., “I am confused about how I feel”). The assessment showed strong concordance with the original DERS, and fair-to-good internal consistency (above 0.80 for all subscales except Awareness, which had internal consistency of $\alpha < 0.80$; after excluding Awareness, internal consistency for the total score of the measure improved with $\alpha = .97$). DERS-SF uses a five-point Likert scale running from 1 (almost never) to 5 (almost always) for three items per subscale. The mean of the items equated to the subscale scores and the higher the score, the more difficulty the respondent had with emotion regulation. Items from the Awareness subscale are reverse coded.

Procedure

Power Analysis

We used the population correlation coefficient as the effect size measure for our power analysis. To select a correlation coefficient, we examined previous research on the relationship between invalidation and emotion dysregulation. One such study showed correlation values around $r = 0.4$ (Zielinski and Veilleux, 2018). We ran a power analysis with this correlation effect size of 0.4, an alpha level of 0.05, and a power of 0.80. Our sample size calculations showed that we needed a total sample size of 47 participants.

Correlation Analyses and Mediation Analyses

We sought to understand the relationship between our different measures using a combination of correlation and mediation analyses. To first determine which mediational analyses were most appropriate, we ran a series of correlations. Pairwise correlations were run between 1) invalidation and appraisal and coping flexibility, 2) invalidation and cognitive control over emotion, 3) appraisal and coping flexibility and emotion dysregulation, 4) cognitive control over emotion and emotion dysregulation, and 5) invalidation and emotion dysregulation. Correlation analyses were done in Python 3.8 using the scipy statistical analysis library.

We took the significant relationships we found from our correlation analysis and performed a mediation analysis. All mediation analyses were performed using the pingouin statistics library in python. We followed the mediation analysis method proposed by Baron and Kenny (1986) and Frazier, Tix, and Barron (2004). In the mediation analysis, we performed a 3-stage process. The first step in the mediation analysis was to establish that there was an effect to be mediated. We fit a linear regression with emotion dysregulation as the outcome variable and perceived invalidation as the predictor variable. If there was a significant relationship between the

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two variables, the second step was to determine whether the predictor variable (perceived parental invalidation) had a significant relationship with our proposed mediating variable (one of the CCFQ subscales). We fit a second linear regression with the subscale as the outcome variable and perceived parental invalidation as the predictor variable. In this second step, we fit a linear regression with the hypothesized mediational variable (one of the subscales from the CCFQ) and perceived invalidation as the predictor variable in order to determine whether the predictor variable is associated with the mediating variable. The third and final step was to determine whether the mediating variable has a partial or full mediating effect. We fit a third regression with emotion dysregulation as the outcome variable and perceived parental invalidation and our CCFQ subscale as predictor variables. We then examined the significance of the coefficients for each of the predictor variables. If perceived parental invalidation was no longer a significant predictor of emotion dysregulation and the CCFQ was a significant predictor, we could conclude that the CCFQ has a *full mediating effect*. In contrast, if both predictors were significant, we could conclude that the CCFQ has a *partial mediating effect*.

Results

We conducted descriptive analyses on age, gender, race or ethnicity, nation in which an individual was born, socio-economic status, level of education, caregiver's role in the individual's life, and prior history of: psychological diagnosis, psychological treatment, usage of DBT skills or DBT-related treatment. Participants were primarily Female (87.5%, $n = 77$; see Figure 1), Chinese (84.1%, $n = 74$; See Figure 4), and had a mean age of 22.31 +/- 2.06 years (See Figure 1).

We found that primary caregivers predominantly consisted of both mother and father (67.05%; $n = 59$) and most young adults lived with their parents (70.5%; $n = 62$). In addition, most individuals' highest level of education obtained included a Bachelor's degree (63.64%; $n =$

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56). Several of the participants endorsed a prior history of psychological diagnosis (19.32%; $n = 17$) and a history of attending psychotherapy (30.68%; $n = 27$). There were no responses for the question item inquiring about whether those that attended therapy have ever utilized DBT skills from DBT or DBT-informed treatment. Plots for the demographic analyses can be found in Figures 1 to 5.

We used correlation analyses to measure the relationship between pairwise comparisons of our survey metrics. We first examined the relationship between perceived parental invalidation (measured using the PIES scale) and emotion dysregulation (measured using the DERS-SF scale). We hypothesized that perceived invalidation and emotion dysregulation are positively correlated. Our analyses revealed a significant positive relationship ($r(88) = 0.506, p < 0.01$), supplying supporting evidence that perceived parental invalidation appears to have a strong impact on emotion dysregulation (Table 2).

Next, we looked at how parental invalidation was related to the two subscales of the CCFQ. We hypothesized that perceived invalidation and cognitive control over emotion are negatively correlated. We also hypothesized perceived invalidation and appraisal and coping flexibility to be negatively correlated. Our results showed a significant negative correlation between perceived parental invalidation and cognitive control over emotion ($r(88) = -0.264, p < 0.01$), indicating the higher perceived parental invalidation, the lower was the cognitive control over emotions. However, we did not see a significant correlation between perceived parental invalidation and appraisal and coping flexibility ($r(88) = 0.047, p = 0.66$) (Table 2)). These results suggested that perceived parental invalidation plays a larger role on cognitive control over emotion than on appraisal and coping flexibility.

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Next, we looked at how the two subscales of the CCFQ were related to emotion dysregulation. We hypothesized that cognitive control over emotion and emotion dysregulation are negatively correlated. Our results showed a significant negative correlation between cognitive control over emotion and emotion dysregulation ($r(88) = -0.482, p < 0.01$), indicating that the higher the level of cognitive control over emotion, the less emotion dysregulation they had. We also hypothesized appraisal and coping flexibility and emotion dysregulation to be negatively correlated. When we examined the correlation between appraisal and coping flexibility and emotion dysregulation, though, we did not see a significant effect ($r(88) = -0.163, p = 0.13$) (Table 3). This evidence aligned with our previous analysis in which appraisal and coping flexibility was not strongly related to perceived parental invalidation.

Finally, we examined the correlations between the two cognitive flexibility subscales themselves to determine the degree to which they were related. We found that there was a significant but low positive correlation between appraisal and coping flexibility and cognitive control over emotion ($r(88) = 0.266, p < 0.01$) (Table 2). These results suggested that while the two subscales are related, they are clearly measuring unique aspects of cognitive flexibility.

Our results from our correlation analyses showed that there were significant relationships between perceived parental invalidation and emotion dysregulation. Similarly, we observed that perceived parental invalidation and emotion dysregulation were both significantly correlated with the cognitive control over emotion subscales from the CCFQ. Given these significant relationships, we sought to understand whether either of the subscales of the CCFQ had a mediating effect on the relationship between perceived parental invalidation and emotion dysregulation. We ran a mediation analysis with emotion dysregulation as the dependent variable,

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perceived parental invalidation as the independent variable, and each of our subscales from the CCFQ as the mediating variable (see Tables 3 and 4).

Table 3 shows the steps for each of the 3 regressions using cognitive control as the potential mediating variable. The first regression indicated that perceived parental invalidation was a significant predictor of emotion dysregulation ($\beta = .31, p < .01$; Path c in Figures 6 and 7). The second regression indicated that perceived parental invalidation was a significant predictor of cognitive control over emotion ($\beta = -.13, p = .01$; Path a in Figure 6). In our third regression, we fit a model with emotion dysregulation as the outcome variable and both perceived parental invalidation and cognitive control over emotion as predictor variables ($\beta = .25, p < .01$; Path c' in Figure 6). The third regression showed that perceived parental invalidation ($\beta = .31, p < .01$; Path c in Figure 6) and cognitive control over emotion ($\beta = -.61, p < .01$; Path b in Figure 6) were significant predictors of emotion dysregulation. Since 1) perceived parental invalidation was significant in the first and third regressions, 2) the relation between the predictor variable, invalidation, and the outcome variable, emotion dysregulation, controlling for the mediator, cognitive control over emotion is *not* zero, and 3), the relation between the predictor, invalidation, and the outcome, emotion dysregulation is significantly smaller when the mediator is in the equation (Path c') than when the mediator is not in the equation (Path c), but still greater than zero, we concluded that cognitive control over emotion has a partial mediating effect. Had perceived parental invalidation been significant in the first stage but non-significant in the third stage when being controlled for by cognitive control over emotion, we would have concluded that there was a full mediating effect, otherwise known as the mediator completely accounting for the relation between the predictor and the outcome.

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We ran a similar analysis using appraisal and coping flexibility (see Table 4). In our second regression, we found that perceived invalidation was not a significant predictor of appraisal and coping flexibility, a finding that aligned with our correlation analysis.

Unsurprisingly, when we fit a regression with emotion dysregulation as the outcome variable and perceived parental invalidation and appraisal and coping flexibility as the predictor variables, we did not observe a significant beta coefficient for appraisal and coping flexibility ($\beta = .31$; $p < .01$) (See Table 4; Figure 7).

The mediational hypothesis we tested was that when individuals perceive more parental invalidation, they will use less cognitive control over emotion (Path a), and individuals who engage more in cognitive control over emotion will be able to experience less emotion dysregulation (Path b). Results indicated that once the relation between cognitive control over emotion and emotion dysregulation were accounted for, there was a weaker relation between perceived parental invalidation and emotion dysregulation (i.e., Path c'; $\beta = .25$; $p < .01$ is smaller than Path c; $\beta = .31$; $p < .01$). These results reveal cognitive control over emotion as a partial mediating variable between perceived parental invalidation and emotion dysregulation. This means cognitive control over emotion plays a significant role in mediating the impact of perceived parental invalidation on emotion dysregulation. The fact that it is a partial and not full mediator (i.e., that there is still a significant relationship between invalidation and emotion dysregulation after controlling predictors, Path a and Path b) makes sense with regard to the biosocial theory (Linehan, 1993a) that suggests a direct relationship between invalidation and emotion dysregulation. However, we now know that cognitive control over emotions partially explains this relationship. That is, more invalidation relates to less cognitive control over emotions. In turn, less cognitive control over emotions relates to more emotion dysregulation.

Discussion

The goal of this study was to examine the relationship between perceived parental invalidation, cognitive flexibility, and emotional dysregulation in Asian young adults. We chose to run this study in Asian participants because previous work has shown that invalidation is high among many Asian families (Ahn, Kim, and Park, 2008; Hahn, Gonyea, Chiao, & Koritsanszky, 2014; Lee, Keng, Yeo, and Hong, 2021). This is believed to be related to cultural value systems in which emotion control and parenting styles are emphasized (Ford and Mauss, 2015; Kim, Atkinson, Umemoto, 2001; Keng & Wong, 2017; Olsen et al., 2002; Park et al., 2010). Meta analyses of invalidation in Asian populations, however, have primarily focused on more extreme forms of invalidation (Lee, Keng, Yeo, & Hong, 2021). Less work has focused on the non-extreme forms of invalidation in the Asian population. Given this gap in the literature, we ran a study in which we specifically assessed the predictive and mediational relationships between perceived parental invalidation and emotion dysregulation with two subfactors within cognitive flexibility; “cognitive control over emotion” and “appraisal and coping flexibility” in Asian young adults.

Perceived parental invalidation has a strong relationship with emotional dysregulation

Experiences in invalidation can lead to emotional dysregulation and impairments in cognitive processing (Linehan 1993a, Martel & Fuchs, 2017). In this study, we hypothesized that a similar effect would be seen in Asian young adults. Our results were consistent with the hypothesis that increased perceived invalidation is associated with higher emotion dysregulation. We found a significant positive correlation between perceived parental invalidation and emotion dysregulation as well as a significant predictive relationship between these two factors in our mediation analysis. These results from a primarily Chinese group of young adults align closely

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with previous literature. It's been shown that the link between coping flexibility and psychological adjustment is strong in populations of young adults that originate from countries with lower individualism and with higher average ages (Chen, Lau, and Chan, 2014; Keng & Wong, 2017).

Cognitive control over emotion plays an important role as a mediating factor on perceived parental invalidation and emotional dysregulation.

Our study also sought to investigate how subscales of the CCFQ were related to perceived parental invalidation and emotion dysregulation. We started by examining the cognitive control over emotion subscale. Our analysis found that perceived parental invalidation was negatively correlated with cognitive control over emotion. This suggested that individuals who received more parental invalidation may be less capable of using cognitive control over emotion. Our mediational analyses also demonstrated that cognitive control over emotion had a significant effect as a mediating factor on parental invalidation and emotional dysregulation. A previous study by Gabrys and colleagues showed that *cognitive control over emotion* was strongly associated with cognitive reappraisal, perseverative thinking, and rumination (2018). Prior literature has shown that CCFQ's cognitive control over emotion focuses more on the ability (or inability) to facilitate adaptive coping strategies and disengage from negative cognitive and emotional states, such as brooding rumination (Gabrys et al., 2018; Miranda and Nolen-Hoeksema, 2007; Nolen-Hoeksema, Wisco, and Lyubomirsky, 2008). This rumination opposes the reflective quality that emotion regulatory mechanisms, cognitive reappraisal and expressive suppression (emotional containment) possesses (Gross, 1998b; 2001).

We found that cognitive control over emotion was negatively correlated with emotion dysregulation. Our findings suggest that young adults with high cognitive control over emotions may better regulate affect than those with low cognitive control during stressful situations. It's

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believed that cognitive control can reduce negative emotions or increase positive emotions during stress (Gabrys et al., 2018). Chronic stressors, however, can negatively attenuate cognitive control, potentially leading to greater difficulties with engaging in flexible behaviors and regulating emotions (Gabrys et al., 2018; Liston et al., 2009).

Greater scores on cognitive control over emotion may be related to seeing situations as more of a “challenge” and more “controllable” (Gabrys et al., 2018). In support of this idea, our mediational analyses found cognitive control over emotion was a partial mediator. This suggests that the predictor, invalidation, preceded both cognitive control and emotion dysregulation (the outcome variable). Given prior literature on invalidation predicting emotion dysregulation (Linehan, 1993a; Martel & Fuchs, 2017), it makes sense that cognitive control over emotion was found to be a partial mediator. It may also be possible that individuals who experience more emotion dysregulation are more likely to experience less cognitive control over emotion, since these are correlational, but not causal, relationships. In a prior study, when individuals with lower levels of cognitive control encounter more acute stressors, they would view the challenge as more stressful and show more negative affect following the situation (Gabrys et al., 2018). Nolen-Hoeksema and colleagues hypothesized that cognitive control may include the ability to disengage from rumination, which would reduce negative emotional states and facilitate proactive coping strategies (2008). As a partial mediator, cognitive control over emotion is strongly linked to emotion-focused and avoidant coping, which may warrant further research in understanding effective coping processes.

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Appraisal and coping flexibility did not exhibit strong relationships with parental invalidation or emotional dysregulation

Invalidation experiences disturb cognitive processes and greatly impact emotional reactivity (Linehan 1993a, Fruzzetti et al., 2005). Better cognitive flexibility is thought to improve versatility for switching between assimilative and accommodative coping strategies (Gabrys et al., 2018; Vriezekolk et al., 2012). Given that we saw significant relationships between perceived parental invalidation and the cognitive control over emotion subscale of the CCFQ, we also expected to see significant relationships with the appraisal subscale of the CCFQ. Contrary to our expectations, though, we did not observe significant correlations between perceived parental invalidation and appraisal and coping flexibility, the second subscale of our cognitive flexibility measure. We also did not observe any significant correlations between appraisal and coping flexibility and with emotion dysregulation. Unsurprisingly, a follow up mediation analysis did not provide evidence that appraisal and coping flexibility serves as potential mediator on perceived parental invalidation and emotion dysregulation.

One possible reason that we did not observe any significant relationships for appraisal and coping flexibility with our other experiment measures is due to differences in cognitive reappraisal. Cognitive reappraisal is an antecedent-focused emotion regulation strategy that responds to a stressor in a way that either heightens or lessens the emotional impact (Ochsner & Gross, 2005; Ochsner et al., 2012; Gross and John, 2003; Kelley, Glazer, Pornpattananangkul, and Nusslock, 2019). Gabrys and colleagues (2018) hypothesized that the processing speed to when individuals may arrive at cognitive reappraisal may be with rapid realization or with little consideration for the situational context. Young adults in our study may have exhibited individual differences in how successfully they utilized cognitive reappraisal, leading to large variance in the

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average scores for each individual. Future work may focus on implementing reappraisal and better understanding the relationship between cognitive control and reappraisal.

Subscales within the CCFQ exhibit relationships between one another

The neural regions associated with cognitive reappraisal overlap with those associated with cognitive control (Ochsner & Gross, 2005; Kalisch, 2009). Our results showed a significant, although modest, association between cognitive control over emotion and appraisal and coping flexibility. Neuroscientific findings suggest that cognitive reappraisal tends to increase activity in cognitive control regions of the brain, such as the dorsolateral prefrontal cortex and decreases activity in emotion-related regions, such as the amygdala (Buhle et al., 2014; Goldin, McRae, Ramel, & Gross, 2008; Kanske, Heissler, Schonfelder, Bongers, & Wessa, 2012; Ochsner & Gross, 2008; Ochsner et al., 2004). The modest relationships between the subscales justified conducting separate mediational analyses for each subscale.

Limitations, Future Research Directions, and Conclusions

These findings must be interpreted in light of some of the study's limitations. First, our sample size was relatively small, and not representative of the general population. One challenge in our findings though, is that these results were only generalizable to a sample composed of primarily Chinese-born young adults or US-born young adults. Further research may explore whether these results hold beyond the subset of Asian young adults in our study.

Secondly, explanatory variables are measured from self-reported scales, subject to measurement errors. With the PIES, all items asked about invalidation within an environmental context as opposed to relationships. Although Linehan's biosocial model (1993a) addresses the environmental aspect of invalidation, understanding the severity and duration of perceived invalidation with the young adults' caregivers is important to address the situational context.

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Moreover, when assessing cognitive and affective processes that may operate partially or completely outside of the conscious awareness, we need to hold concerns regarding the accuracy and validity of self-report (Nock et al., 2009). As current emotion dysregulation may impact perceptions of invalidation, it would be useful to conduct a prospective study, tracking parental invalidation and emotion dysregulation as they transact over time. Related to issues with use of self-report measures, there are various measures of cognitive flexibility available, and we chose one that was reliable, valid, and seemed to capture the aspects of cognitive flexibility that were of interest. Perhaps one of the other measures would have yielded somewhat different findings.

Thirdly, gender and ethnicity are limited to a primarily female Chinese ethnic origin (87.5% female; 84.1% Chinese respectively). Future findings should include a greater sample of a more diverse population across the breadth of diasporas in the Asian community to obtain more generalizability and to better inform our interpretations of cultural context. A prior study also highlighted gender differences in cognitive flexibility, particularly the control subset (Dağ & Gülüm, 2013). Results showed that cognitive flexibility - control did not mediate the relationship between avoidant attachment and psychopathology symptoms for men, while it partially mediated the relationship between avoidant attachment and depression and social anxiety for women (Dağ & Gülüm, 2013). It has been suggested that differential performance with cognitive flexibility manifests from even as young as age three to six in boys and girls as a result of gender differences in the functional organization of the brain for language and information processing speed (Memisevic & Biscevic, 2018).

Further research may also benefit from addressing not just discrepancies in gender, but also cultural context, including factors of acculturation and assimilation, and generational gaps. Moreover, there have been studies that found maternal invalidation was more prominent than

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paternal or familial invalidation within Asian communities (Lee, Keng, Yeo, and Hong, 2021; Warner, Hernandez, & Veilleux, 2020). Examining the perceived importance of the mother-child dyad or relationship between the prominent caregiver and child may prove salient when considering the biosocial model and how cognitive flexibility plays a role between invalidation and emotion dysregulation.

In addition, due to the cross-sectional nature of this study, we cannot draw robust causal inferences. Thus, with the help of future research that looks at the case prospectively, we may be able to ascertain the nuances of cognitive flexibility as a partial mediator for the predictive relationship of chronic invalidation and emotion dysregulation in varied Asian diasporas over time. As prior research disclosed a discrepancy of usage between subsets of cognitive appraisal among older adults (Liang, Huo, Kennison, & Zhou, 2017, perhaps a prospective study could discern successful implementation of ideal flexibility when faced with chronic stressors.

Since we solely examined a general population sample, our findings are limited with regard to generalizability to a clinical population. One direction for future research might be to consider a group comparison design to involve groups with different levels of invalidation or dysregulation and compare aspects of cognitive flexibility, or to compare these qualities within both clinical and non-clinical samples.

Despite these limitations, this study represents an important step toward improving our understanding of cognitive flexibility subtypes and their relationship with invalidation and emotion regulation within a biosocial context among the general Asian young adult community. Moving forward, there remain a number of outstanding questions that future studies may address. The interplay among cognitive control over emotion, working memory capacity, and cognitive reappraisal likely work in concert with one another to drive function. Here, we have examined a

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specific internal process, but there likely exist additional complex interactions within and across systems that drive the predictive relationship of invalidation and emotion dysregulation.

Understanding the ways in which these relationships contribute to emotion regulation will be key to developing treatments for clinical samples as well as individuals in general that struggle with perceived invalidation within their families. To do this, future studies may continue to expand the scope of their investigations into various diasporas of the Asian community to produce more robust conclusions with cultural considerations.

Our study contributes to the research on cognitive processing and emotion regulation. Our findings are salient in further developing considerations for interventions and treatment plans in reducing perceived invalidation from parents through possible parent-focused interventions, or even through targeting emotion dysregulation to reduce one side of the transaction described in the biosocial theory; as a mediator, cognitive control processes might play a key role. Mitigating the impact of perceived parental invalidation through potentially enhancing cognitive control processes such as attention shifting might prove a useful direction. To enrich our findings, future research may consider longitudinal or prospective studies to clarify the mediation of cognitive flexibility in the relationship between parental invalidation and emotion regulation within the biosocial context. Follow up work may include the addition of assessment tools for cognitive control over emotions for more individualized treatment plans and interventions. In particular, for young adults who struggle with their emotion regulatory pathways, enhancing cognitive control over emotions may be done through dialectical behavioral therapy.

Specifically targeting cognitive control processes may enhance emotion regulation ability. The evidence of cognitive control over emotions as a mediating variable for invalidation and emotion dysregulation can inform interventions that target executive functioning skills and

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thereby decrease emotion dysregulation. As cognitive dysregulation, an extreme type of non-dialectical thinking may lead to pervasive emotional and behavioral dysregulation (Bonavitacola, Miller, McGinn, and Zoloth, 2019), incorporating increased dialectical thinking may target cognitive flexibility, an area rarely studied as a direct treatment target in DBT. In addition, specific treatment foci based on cognitive control strategies in DBT might be tested for their ability to help with recovery from experiences of invalidation in the moment and to boost strategies to regulate emotions. For example, skills such as One Mindful Participation, Check the Facts, Opposite Action, and Distract with ACCEPTS skills can be applied, along with executive functioning strategies from evidence-based treatments of ADHD. Finally, including family members in treatment, or conducting family sessions, as in the DBT for Adolescents model might be helpful for Asian young adults who report disrupted cognitive control processes and emotion dysregulation from ongoing perceived parental invalidation. Finally, increasing validation in the face of chronic stressors in the Middle Path module may help target these cognitive control processes and reduce emotion dysregulation.

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Table 2*Pearson Correlation values among study variables.*

	1	2	3	4
1. <i>PIES</i> score	-			
2. <i>CCFQ ACF</i> score	.05	-		
3. <i>CCFQ CCE</i> score	-.26**	.27**	-	
4. <i>DEERS-SF</i> score	.51**	-.16	-.48**	-

Note. ** $p < .01$ *PIES* score is the average of the total score of participant's responses to assess level of emotion invalidation via the Perceived Invalidation of Emotion Scales.*CCFQ ACF* score is the average of the total score for the subscale, Appraisal and Coping Flexibility within the within the Cognitive Control and Flexibility Questionnaire.*CCFQ CCE* score is the average of the total score for the subscale, Cognitive Control over Emotion within the Cognitive Control and Flexibility Questionnaire.*DEERS-SF* score is the average of the total score for the Difficulties in Emotion Regulation Scale – Short Form.**Table 3***Cognitive control over emotion as mediator*

		β	Std. error	95% CI	p
Step 1	Invalidation and ED	.31	.06	(.20, .42)	.00**
Step 2	Invalidation and CC over emotion	-.13	.05	(-.23, -.03)	.01*
Step 3	CC over emotion and ED	-.61	.12	(-.85, -.37)	.00**
	Invalidation, CC over emotion, and ED	.25	.05	(.14, .36)	.00**

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

CC over emotion is cognitive control over emotion

Emotion dysregulation is ED

Table 4*Appraisal and coping flexibility as mediator*

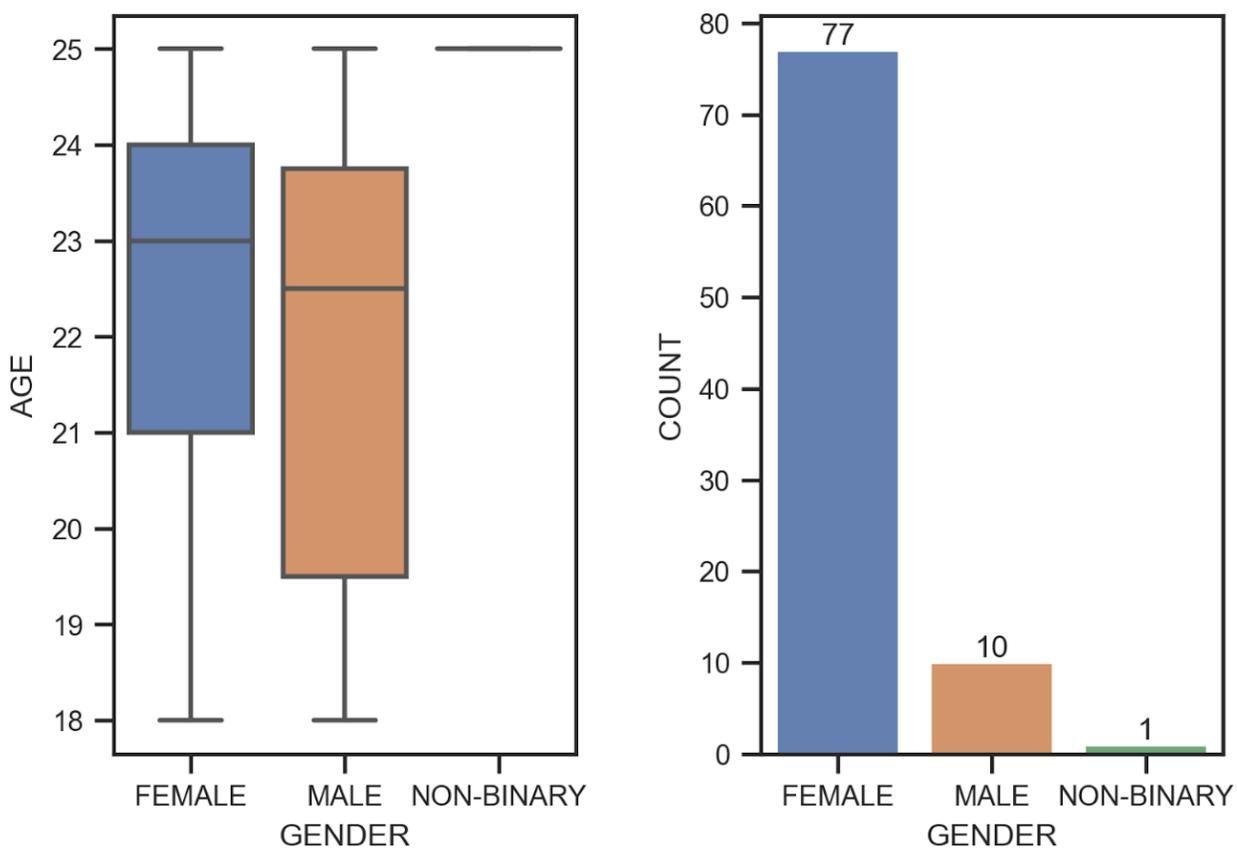
		β	Std. error	95% CI	p
Step 1	Invalidation and emotion dysregulation	.31	.06	(.20, .42)	.00**
Step 2	Invalidation and ACF	.04	.09	(-.14, .21)	.66 ^{ns}
Step 3	ACF and ED	-.12	.08	(-.28, .04)	.13 ^{ns}
	Invalidation, ACF, and ED	.31	.06	(.20, .43)	.00**

Note. * $p < .05$, ** $p < .01$, *ns* = not significant

Appraisal and coping flexibility is ACF

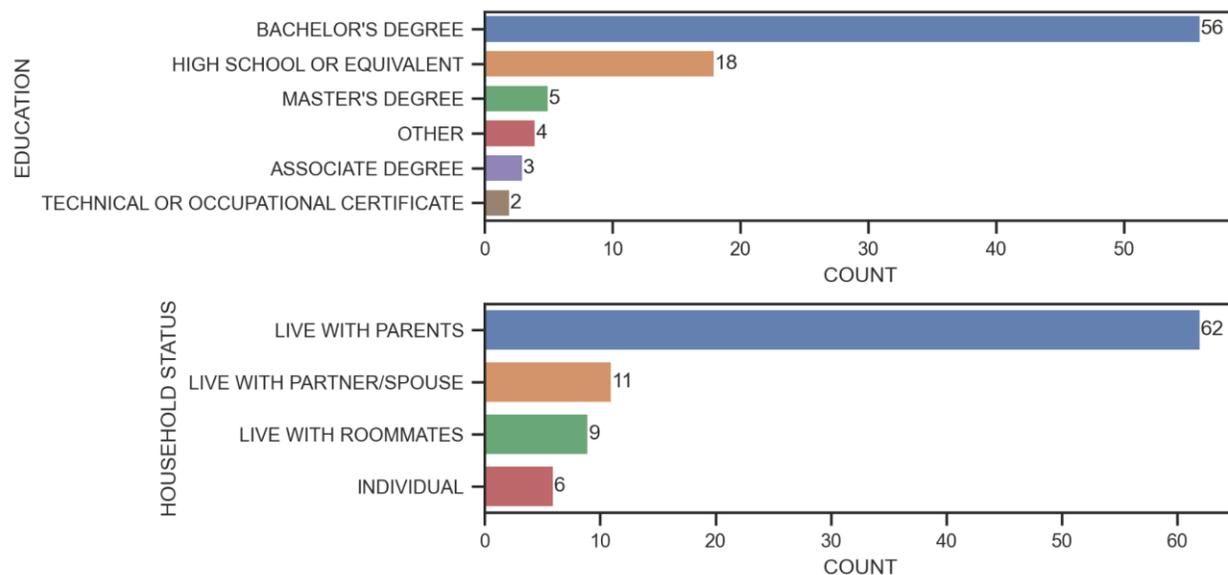
Emotion dysregulation is ED

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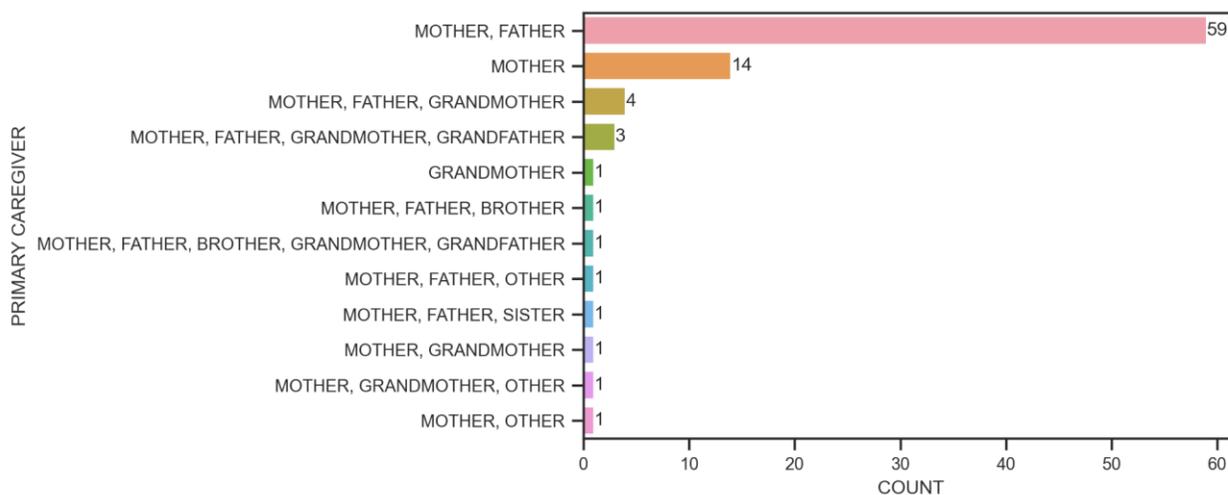
Figure 1*Age Distributions across Gender and Gender Counts*

Note. The boxplots on the left display the age distributions across the 3 self-selected genders in the study. The right bar chart displays the number of participants for each self-selected gender.

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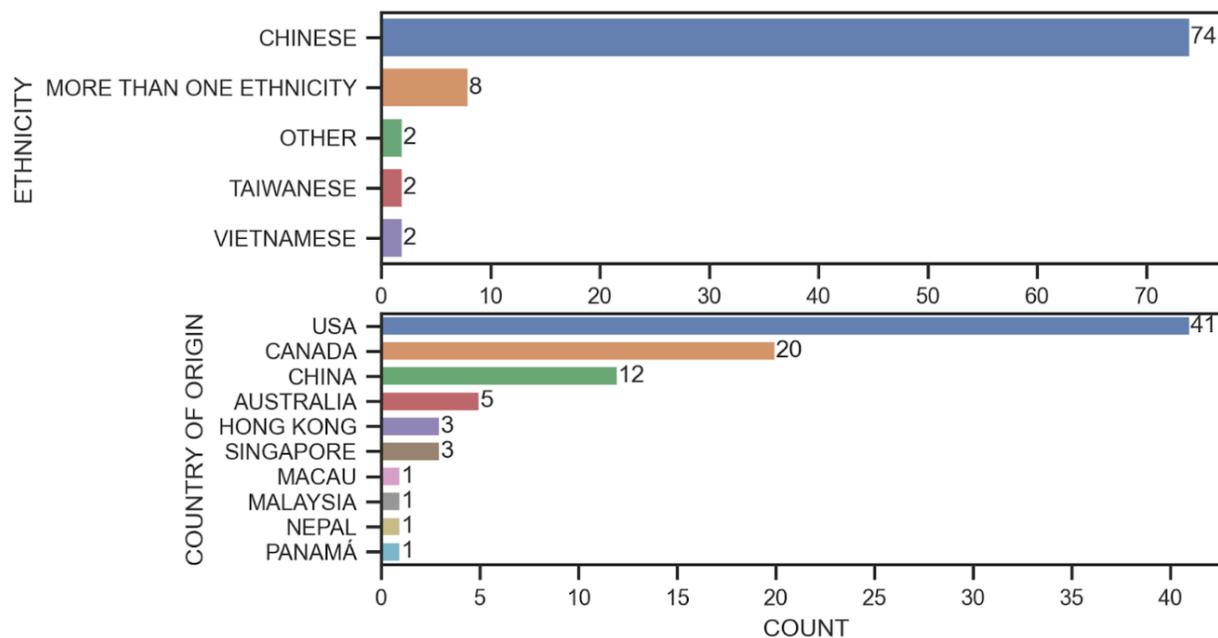
Figure 2*Frequencies of Education and Household Status*

Note. In the top figure, the y-axis shows the highest level of education degrees earned. The x-axis shows the total count. In the figure below, the y-axis shows the self-reported household status. The x-axis shows the total count. Individual category counts are displayed next to each bar.

Figure 3*Frequencies of Primary Caregivers*

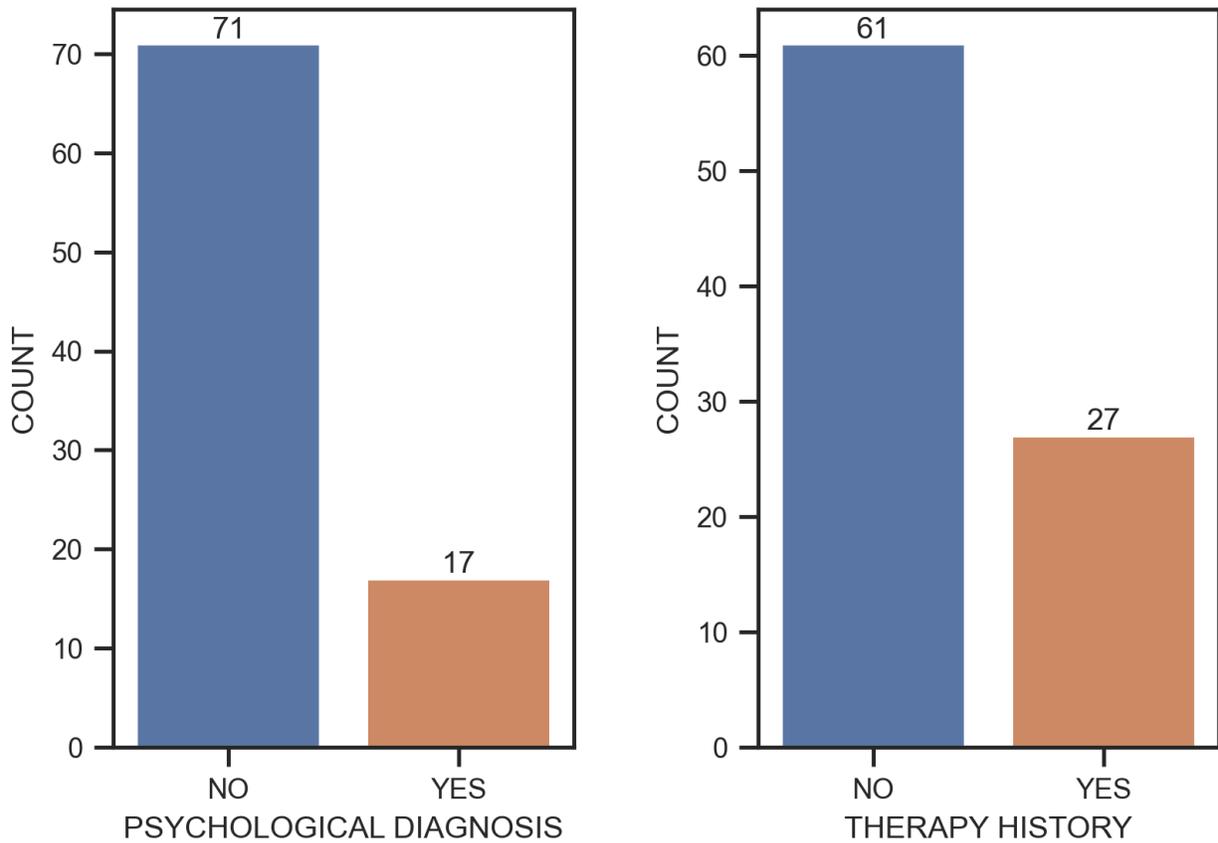
Note. The x-axis shows the total count. The y-axis shows the primary caregiver(s) of the individual. Individual category counts are displayed next to each bar.

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Figure 4*Frequencies of Identified Ethnicities and Country of Origin*

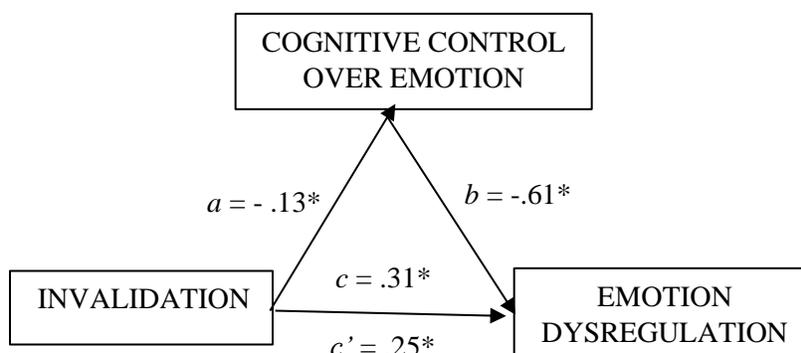
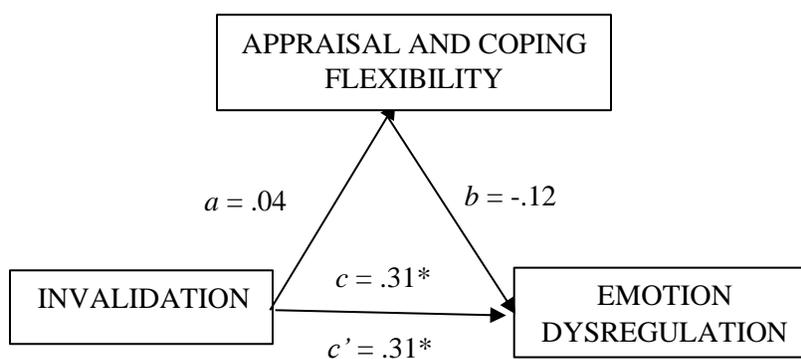
Note. In the top figure, the y-axis shows the identified ethnicity. The x-axis shows the total count. In the figure below, the y-axis shows the country of origin. The x-axis shows the total count. Individual category counts are displayed next to each bar.

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Figure 5*Frequencies of Psychological Diagnosis and Therapy History*

Note. In the figure on the left, the y-axis shows the total count. The x-axis shows whether individuals have ever had a psychological diagnosis. In the figure on the right, the y-axis shows the total count. The x-axis shows whether individuals have a history of attending psychotherapy. Individual category counts are displayed above each bar.

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Figure 6*Cognitive control over emotion as mediator***Figure 7***Appraisal and coping flexibility as mediator*

Appendix A**A1. Demographic Questionnaire****Participant Number:** _____**Age:** _____**Gender:** _____**Race/Ethnicity:** _____ / **Bi- or Multi-Ethnicity:** _____ / **Other (please specify):** _____**Nation in which you were born:** _____**Level of education:** _____**Caregiver(s)' role(s) in your life:**

- Mother
- Father
- Sister
- Brother
- Grandmother
- Grandfather
- Other: _____

Please indicate your current household status:

- Individual_____
- Live with parents_____
- Live with roommates_____
- Live with partner/spouse_____
- Live with partner/spouse and children_____
- Live at university housing_____

Please answer Y/N for the following questions:

Psychological diagnosis? Y/N

Prior history of therapy or ongoing treatment? Y/N

If yes, have you ever used any DBT skills from DBT or DBT-informed treatment? Y/N

A2. Perceived Invalidation of Emotion Scales (PIES; Zielinski and Velleux, 2018)

1	2	3	4	5
Almost Never (0-10%)	Sometimes (11-35%)	About half the time (36-65%)	Most of the time (66-90%)	Almost Always (91-100%)

1. When I share how I'm feeling, my parents don't seem to mirror or match my emotions. For example, my parents don't share sadness with me when I'm sad or happiness with me when I'm happy.				

2. When I share how I'm feeling, my parents want me to "get over it" or "accept it and move on."				

3. When I share how I'm feeling, my parents seem like they don't want to hear what I have to say.				

4. When I share how I'm feeling, my parents look down on me or judge me.				

5. When I share how I'm feeling, my parents don't take me seriously.				

6. When I try to share how I'm feeling, my parents tell me or imply what I should actually feel.				

7. My parents get mad or upset at me when I express my feelings.				

8. My parents don't take my side or agree with how I'm feeling.				

9. My parents make me feel like it's not okay for me to feel the way that I do.				

10. My parents make me feel that my emotions are unimportant.				

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A3. The Cognitive Control and Flexibility Questionnaire (CCFQ; Gabrys, Tabri, Anisman, and Matheson, 2018)

The purpose of this questionnaire is to determine what you generally think/feel/do when stressful situations provoke negative thoughts and emotions. Of course, you may act differently depending on the situation, but try to think of what you usually think/feel/do when you are stressed or upset. Using the scale below, indicate the extent to which agree or disagree with the following statements.

Generally, in stressful situations ... (specific question follows here):

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
<hr/>						
___1. I weigh out my options before choosing how to take action.						
___2. I feel like I lose control over my thoughts and emotions.*						
___3. I approach the situation from multiple angles.						
___4. It's difficult to let go of intrusive thoughts or emotions.*						
___5. I consider the situation for multiple viewpoints before responding.						
___6. I take the time to think of several ways to best cope with the situation before acting.						
___7. I find it easy to set-aside unpleasant thoughts or emotions.						
___8. It is easy for me to ignore distracting thoughts.						
___9. I can easily think of multiple coping options before deciding how to respond.						
___10. I take the time to see things from different perspectives before reacting.						
___11. I get easily distracted by upsetting thoughts or feelings.*						
___12. I take the time to think of more than one way to resolve the problem.						
___13. I control my thoughts and feelings by putting the situation into context.						
___14. I can remain in control of my thoughts and emotions.						
___15. I have a hard time managing my emotions.*						
___16. My thoughts and emotions interfere with my ability to concentrate.*						
___17. I manage my thoughts or feelings by reframing the situation.						
___18. It's hard for me to shift my attention away from negative thoughts or feelings.*						

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A4. Difficulties in Emotion Regulation Scale – Short Form (DERS-SF; Kaufman et al., 2015)

Please indicate how often the following apply to you.

	Almost Never (0–10%)	Some- times (11– 35%)	About Half Of the Time (36– 65%)	Most of the Time (66– 90%)	Almost Always (91– 100%)
1. I pay attention to how I feel	1	2	3	4	5
2. I have no idea how I am feeling	1	2	3	4	5
3. I have difficulty making sense out of my feelings	1	2	3	4	5
4. I care about what I am feeling	1	2	3	4	5
5. I am confused about how I feel	1	2	3	4	5
6. When I'm upset, I acknowledge my emotions	1	2	3	4	5
7. When I'm upset, I become embarrassed for feeling that way	1	2	3	4	5
8. When I'm upset, I have difficulty getting work done	1	2	3	4	5
9. When I'm upset, I become out of control	1	2	3	4	5
10. When I'm upset, I believe that I will end up feeling very depressed	1	2	3	4	5
11. When I'm upset, I have difficulty focusing on other things	1	2	3	4	5
12. When I'm upset, I feel guilty for feeling that way	1	2	3	4	5
13. When I'm upset, I have difficulty concentrating	1	2	3	4	5
14. When I'm upset, I have difficulty controlling my behaviors	1	2	3	4	5

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15. When I'm upset, I believe there is nothing I can do to make myself feel better	1	2	3	4	5
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16. When I'm upset, I become irritated with myself for feeling that way	1	2	3	4	5
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17. When I'm upset, I lose control over my behavior	1	2	3	4	5
---	---	---	---	---	---

18. When I'm upset, it takes me a long time to feel better	1	2	3	4	5
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