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The Dynamics of Emotion-Related Impulsivity: An Analysis of Emotional Control and Daily Emotion-Driven Urges and Actions via Ecological Momentary Assessment

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The Dynamics of Emotion-Related Impulsivity: An Analysis of Emotional Control and Daily Emotion-Driven Urges and Actions via Ecological Momentary Assessment

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Abstract

Emotion-related impulsivity, or the engagement in impulsive reactions specifically in response to emotions, has been identified as a crucial transdiagnostic factor. Mixed evidence from ecological momentary assessments (EMA) underscores a potential discrepancy between the existing measurements of emotion-related impulsivity at trait and state levels. Unlike previous EMA studies examining emotion-related impulsivity through measures of urgency, the current study tested Carver and colleagues' (2008) reflexive responding to emotion framework by investigating the relationship between emotional control and emotion-related impulsivity. Participants (N = 197) with varying levels of emotional control completed one week of EMA to investigate two central questions. First, we investigated whether varying trait levels of emotional control predicted momentary self-efficacy for managing emotion as measured by distress intolerance and willpower when people were experiencing stronger emotions than typical, where we predicted that those with less emotional control would exhibit decreased momentary self-efficacy for managing emotion in comparison to those with greater emotional control. Second, we tested whether trait levels of emotional control would impact momentary urges and actions in response to elevated emotions among those with varying sensitivities toward reward and threat. Specifically, we predicted that, among those with low emotional control, 1.) decreased reward sensitivity and increased threat sensitivity would be associated with *rash inaction* in response to higher negative and lower positive affect, and 2.) increased reward sensitivity and decreased threat sensitivity would be associated with *rash action*. Findings support the notion that perception of emotional control is associated with momentary self-efficacy for managing emotion and provide partial support for the reflexive responding to emotion framework.

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Introduction

In response to the limitations of assessing psychopathology within the framework of categorial taxonomies (e.g., *DSM-5*; American Psychiatric Association, 2013), there has been a recent push to move towards a dimensional system in which spectra of psychopathological syndromes and their components are organized based on related features. Symptoms common across higher-order dimensions, such as internalizing and externalizing disorders, are said to be transdiagnostic (Howard, 2018). Further, recent work suggests that a superordinate factor, known as the 'p' factor, may serve as a common connection linking the majority of mental disorders (Caspi et al., 2014). Identifying the specific risk factors that relate to p may advance our understanding of the etiological underpinnings of mental disorders as well as inform transdiagnostic treatment approaches (Carver et al., 2017; Caspi et al., 2014).

Carver and colleagues (2017) argue that *emotion-related impulsivity* may be the p factor. Emotion-related impulsivity refers to the engagement in impulsive reactions specifically in response to emotions (Carver et al., 2011). Studies utilizing dispositional measures (e.g., UPPS-P Impulsive Behavior Scale; Lynam et al., 2006; Three-Factor Impulsivity Index; Carver et al., 2011) indicate that emotion-related impulsivity is associated with a range of psychopathological spectra. Indeed, emotion-related impulsivity has been associated with externalizing problems including aggression (Johnson, Carver, & Joormann, 2013; Johnson & Carver, 2016), substance use (Berg et al., 2015), borderline personality disorder (Fulford et al., 2015), bulimia nervosa (Fischer et al., 2008), mania and hypomania (Giovanelli et al., 2013; Johnson, Carver, Mulé, et al., 2013; Muhtadie et al., 2014), and internalizing problems including depression (Carver et al., 2013; Smith et al., 2013) and symptoms of anxiety (Johnson, Carver, & Joormann, 2013).

Reflexive Responding to Emotion (RRE)

Carver and colleagues' (2008) reflexive responding to emotion framework proposes that both rash action and rash inaction may be associated with emotion-related impulsivity. The tendency for mood-based rash action has historically been assessed through measurements of urgency, a personality trait reflective of a tendency for mood-based rash action (Cyders & Smith, 2007; Whiteside & Lynam, 2001). Urgency was originally identified as the tendency for individuals to engage in rash action in response to negative affect (Whiteside & Lynam, 2001). A similar tendency to engage in rash action in response to positive affect was later described (Cyders & Smith, 2007), leading to the classification of both negative and positive urgency.

While urgency measures capture the tendency for mood-based rash action, they fail to assess mood-based rash *inaction*. Rash inaction refers to impulsive responses to emotion that are passive in nature (Carver et al., 2013). For some people, such as those with depression, emotion may trigger responses that reflect an inability to initiate action (Carver et al., 2013). This contrasts externalizing behaviors consistent with rash action, such as engaging in violence (Carver et al., 2013).

The core of the reflexive responding to emotion framework is rooted in theories of dual processing models (Epstein, 1991; Metcalfe & Mischel, 1999; Rothbart et al., 2003; Strack & Deutsch, 2004), which generally identify a reflective mode and a reflexive mode as the two primary systems of information processing. The reflective system involves rational, deliberate thinking and is conducive to planning (Hofmann et al., 2009). Reflective processing requires substantial cognitive resources and becomes less efficient when these resources are depleted (Evans, 2008; Vohs, 2006). In contrast, the reflexive system is less demanding of cognitive resources, quick, and spontaneously responsive to schema activation (Carver et al., 2008).

Furthermore, the reflexive mode is considered to be especially sensitive to emotionally-charged situations (Metcalfe & Mischel, 1999). This is not to say that reflective responding is always without emotion; rather, responding to intense emotions that demand increased cognitive resources is more likely to trigger associative, reflexive action (Carver et al., 2008).

Additionally, the dispositional tendency to function within the reflexive mode as opposed to the reflective mode is theorized as having implications for mental health. Decades of research establishing a link between emotional reactivity and psychological illness (e.g. Depue, 1995; Johnson-Laird et al., 2006; Spoont, 1992), suggests that the heightened emotional reactivity associated with reflexive functioning may lead to increased vulnerability for psychopathology (Carver et al., 2017a). One factor that may influence the relationship between heightened emotional reactivity and vulnerabilities for psychopathology is *emotional control* (Carver et al., 2008). Emotional control refers to having constraint when reacting to emotion (Carver et al., 2008; Carver et al., 2017) and implies that one has the ability to control their emotions and associated actions. Perceptions of emotional control can be assessed via "emotion constraint" beliefs, which are beliefs that emotions constrain or restrict behavior (Veilleux et al., 2015). Whereas people with high emotional control may believe that they have power over their emotions, people with low emotional control may believe that their emotions are uncontrollable because they are more powerful than the self (Veilleux et al., 2021).

The reflexive responding to emotion framework suggests that among those with diminished emotional control, individual differences in approach and avoidance temperament styles moderate resulting action or inaction in response to emotion (Carver et al., 2008; Carver et al., 2017). People who are highly sensitive to reward are more likely to behave in a manner reflecting a drive to pursue incentives (rash action consistent with externalizing

psychopathology). In contrast, those lacking in reward sensitivity may behave in a manner more reflective of behavioral passivity (rash inaction consistent with internalizing psychopathology). The relationship between emotional control and threat sensitivity is similar in that those highly sensitive to threat are expected to react to threatening emotions in ways that reflect fear and avoidance (rash inaction consistent with internalizing psychopathology), and those with blunted threat sensitivity may behave in a more forward, daring fashion (rash action consistent with externalizing psychopathology; Carver et al., 2017). In sum, the relationship between emotional control and types of emotion-related impulsivity is thought to vary based on temperamental or personality characteristics, such sensitivity to reward and threat; to our knowledge, this idea has yet to be investigated empirically.

Ecological Momentary Assessments of Emotion-Related Impulsivity

To date, the majority of studies investigating emotion-related impulsivity have relied on dispositional self-report measures (Sperry et al., 2021). However, because emotion-related impulsivity theoretically arises in response to emotions that are subjectively intense and influenced by context, assessing emotion-related impulsivity as a state variable is warranted. Ecological momentary assessment (EMA) is a data collection method in which participants complete assessments in real-time and in naturalistic settings (Shiffman et al., 2008). EMA improves ecological validity by capturing information regarding behavior and concurrent contextual features and reduces bias associated with retrospective self-report, as participants respond to numerous prompts throughout the day as events transpire (Shiffman et al., 2008).

Recently, several studies have investigated dynamic aspects of emotion-related impulsivity using EMA (Feil et al., 2020; Sharpe et al., 2020; Sperry et al., 2018, 2021). At the within-person level, increased momentary negative affect has been found to predict greater

acting on impulse (derived from UPPS-P urgency scale) among high school and college students (Feil et al., 2020). Among psychiatric patients with personality disorder diagnoses (Sharpe et al., 2020), momentary negative affect was found to be positively associated with momentary measures of negative urgency. While this establishes that EMA is an effective method for detecting associations among state levels of emotion and emotion-related impulsivity in groups varying in age and clinical status, there is mixed evidence as to whether dispositional measures of emotion-related impulsivity reliably predict momentary emotion-related impulsivity indicators. Two recent studies reported that people with heightened trait impulsivity as measured by the UPPS-P (Sperry et al., 2018) and the Personality Inventory for *DSM-5* Impulsivity subscale (PID-5; Krueger et al., 2012; Sharpe et al., 2020) tended to report higher momentary negative urgency via EMA. However, in perhaps the most robust assessment of dynamic emotion-related impulsivity to date (Sperry et al., 2021), momentary emotion-related impulsivity was not predicted by a variety of measures for dispositional impulsivity, including the UPPS-P, the Impulsivity facet of the Personality Inventory for *DSM-5*-Short Form (PID-5-SF; Maples et al., 2015), and the Self-Harm factor of the Personality Assessment Inventory-Borderline Features (PAI-BOR; Morey, 1991). These findings ultimately underscore a potential discrepancy between the existing measurements of emotion-related impulsivity at trait and state levels (Sperry et al., 2021), and suggest that further work is necessary to understand how (and if) trait-based measures reflect momentary contextual processes.

An important additional step in understanding the influence of emotion-related impulsivity on daily functioning is to explore the relationship between dispositional emotional control and momentary self-efficacy for managing emotion. Indicators of momentary self-efficacy for managing emotion including willpower (Veilleux et al., 2021) and distress tolerance

(Veilleux et al., 2018) have been shown to decrease alongside heightened negative states, demonstrating the relationship between these self-efficacy indicators and emotion. Additionally, because momentary measures of distress intolerance (e.g., "I can keep doing what I'm doing right now, regardless of how I feel"; Veilleux et al., 2018) and willpower (e.g., "If I had to do a task right now that required significant self-control, I would be successful at that task."; Veilleux et al., 2021) can be considered dynamic self-efficacy judgments (Veilleux et al., 2021), they likely reflect momentary perceptions of emotional control. Thus, investigating the relationship between trait emotional control and momentary willpower/distress intolerance could help to better explain the impact of emotion-related impulsivity in daily life.

Current Study

In a departure from previous EMA studies examining emotion-related impulsivity primarily through models of urgency, the current study took a novel approach by investigating the relationship between *emotional control* and emotion-related impulsivity. To test the reflexive characteristics of emotion-related impulsivity that form the basis of the RRE framework proposed by Carver et al. (2008), we utilized EMA to examine two central questions. First, we investigated whether varying trait levels of emotional control predicted momentary self-efficacy for managing emotion as measured by distress intolerance and willpower when people were experiencing stronger emotions than typical, where we predicted that those with less emotional control would exhibit decreased momentary self-efficacy for managing emotion in comparison to those with greater emotional control. Second, we tested whether trait levels of emotional control would impact momentary urges and actions in response to elevated emotions among those with varying sensitivities toward reward and threat. Specifically, we predicted that, among those with low emotional control, 1.) decreased reward sensitivity and increased threat sensitivity would be

associated with *rash inaction* in response to higher negative and lower positive affect, and 2.) increased reward sensitivity and decreased threat sensitivity would be associated with *rash action*.

Method

Participants

Adult community members and undergraduate students participated in the study between August 2021 and May 2022. Community members were recruited via announcements in a daily university newsletter and undergraduate students through their participation in a psychology subject pool. As a part of the screening process, eligible participants were asked to confirm that they had access to cellular data and/or Wi-Fi to download the EMA application and that they could commit to downloading and using a study-specific application for the span of one week. Because the required EMA application is only available on iOS and Android platforms, participants were required to have an iPhone or Android smartphone to complete the study.

Eligible individuals were invited to participate in the study based on emotional control scores on the emotion constraint subscale of the Emotion and Regulation Beliefs Scale (ERBS; Veilleux et al., 2015). Prior data collected by the TEMPT Lab were evaluated to determine the typical distribution of emotion constraint scores, with the intention of having one third of the sample score in the bottom 20% of the distribution, one third in the middle 60%, and one third in the top 20%, essentially oversampling the top and the bottom. Across three studies, the mean emotion constraint score was between 2.36 and 2.56 (S1 subject pool: $n = 255$, $M = 2.56$, $SD = 0.66$; S2 subject pool: $n = 272$, $M = 2.55$, $SD = 0.64$; S3 online adults: $n = 1128$, $M = 2.36$, $SD = 0.79$). The 20% and 80% cut-offs were not identical across studies (20%: S1: 1.91, S2: 2.00, S3: 1.67; 80%: S1: 3.11, S2: 3.11, S3: 3.00), but to maximize the likelihood of obtaining an adequate

sample size for each stratum and thus a substantial range of emotion constraint scores, we set the low stratum as scores less than 1.91, middle stratum from 1.91 to 3.09, and high stratum as scores 3.10 and higher.

Although 227 people completed the informed consent, exclusions were made on the basis of not beginning the EMA portion of the study (n = 3), failing attention checks while completing baseline measures (n = 2), completing the study more than once (n = 2), and completing fewer than 10 random prompts during the EMA (n = 23). This resulted in a final sample size of 197 (mean age = 24.06, SD = 8.26, range: 18-63, 72.6% women), with 110 community members and 87 undergraduate students from the psychology subject pool. Sample sizes for each stratum were distributed as follows: low: n = 63; middle = n = 76; high: n = 58. While the oversampling of the low and high emotion constraint participants did result in a less normal distribution, doing so ensured that we had a greater representation of individuals across the spectrum of emotion constraint.

Procedure

The entire study was conducted remotely. Interested participants were sent an individualized link to complete baseline measurements via Qualtrics, including trait measures of personality and emotion-related impulsivity. After completing baseline measures, participants were given instructions for downloading and using the LifeData (http://lifedatacorp.com) smartphone application utilized for the EMA protocol. Once the study was initiated on the LifeData application, participants proceeded through a start-up session that provided additional instructions for initiating and responding to prompts. Participants then began one week of EMA. Each day, participants received five *random prompts* randomly between 9:30 A.M. and 9:30 P.M. Participants had 10 minutes to complete a random prompt after receiving the notification,

and there was a minimum of 90 minutes between each random prompt. Each random prompt included questions regarding current affect (with potential follow-up questions an hour later), momentary self-efficacy for managing emotion, and urges for impulsive actions (see Measures section below). Endorsement of a strong emotion (i.e., feeling greater or less distress than usual) triggered a *follow-up* prompt an hour later. Additionally, participants were encouraged to complete *current emotion* prompts when experiencing an emotion. These prompts included the same questions as the random prompts but differed in that participants did not receive a notification alerting them to complete the prompt; rather, these were initiated voluntarily in the LifeData application.

Participants were also asked additional questions that were not analyzed for the current study. These included questions within the random and current emotion prompts that assessed self-criticism, thinking clarity, current situation/context (e.g., physical location, who the person was with, current activity), as well as a nightly assessment of stress and engagement in dysregulation behaviors (e.g., loss-of-control eating and alcohol use).

Measures

Trait Measures

Emotional Control. The Emotion Regulation and Beliefs Scale (ERBS; Veilleux et al., 2015) is a 21-item self-report questionnaire measuring beliefs toward emotion. Participants ranked each item on a 5-point scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). Among the 3 factors measured (Emotion Constraint, Regulation Worth, and Hijack) only Emotion Constraint is relevant to the current study. The Emotion Constraint score is calculated as the mean among 9 items (range: 1-5) with lower scores reflecting greater emotional control (α = .84).

Reward/Threat Sensitivity. The Personality Inventory for *DSM-5* Short Form (PID-5-SF; (Maples et al., 2015) is a 100-item self-report questionnaire measuring personality disorder trait domains (Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism; American Psychiatric Association, 2013). Each item is scored using a Likert scale ranging from 0 ("Very False or Often False") to 3 ("Very True or Often True"). The PID-5-SF has been shown to be a reliable and valid measure for assessing personality disorder traits (Bach et al., 2016; Díaz-Batanero et al., 2019; Thimm et al., 2016). In the current study, only the domains of Negative Affectivity (α = .91), Detachment (α = .90), and Disinhibition (α = .90) were included in analyses, as these domains served as proxy measures for reward and threat sensitivity. Negative affectivity was interpreted as a gauge of threat sensitivity; high negative affectivity captures greater worry about the negative impact of future events and fear of uncertainty (high threat sensitivity), whereas low negative affectivity is indicative of emotional stability (low threat sensitivity). Detachment was interpreted as a gauge of reward sensitivity; high detachment captures low approach motivation (low reward sensitivity), whereas low detachment relates to greater hedonic capacity (high reward sensitivity). Disinhibition was interpreted as a gauge of reward sensitivity; high disinhibition captures impulsivity and tendencies for risk taking (high reward sensitivity), whereas low disinhibition aligns with conscientiousness/reflective tendencies (low reward sensitivity).

Momentary Measures assessed via Random and Current Emotion Prompts

Current Affect & Emotional Triggers. To assess for current affect, participants ranked adjective-based items (positive: joyful, calm, relaxed, excited, proud, happy; negative: sad, angry, anxious, ashamed, jealous, guilty) on visual analogue scales from "Not at all" to "Extremely" (range: 0-100) where higher scores were indicative of greater intensity of the state

in question. The use of these emotional adjectives is consistent with past EMA studies (Veilleux, Skinner, et al., 2021; Veilleux, Warner, et al., 2021). Positive and negative affect items were separately averaged to form a positive affect index and a negative affect index. Additionally, participants were asked how they felt in the current moment compared to their typical affective state to gauge whether they were experiencing a strong emotion in that moment. Possible responses to this prompt included, "Less distressed than usual (BETTER than usual)," "As usual (pretty typical for me)," and "More distressed than usual (WORSE than usual)."

Urges for Rash Action and Experiential Avoidance. Each random and current emotion prompt included questions assessing motivational inclinations for engaging in rash action or rash inaction (i.e., experiential avoidance). Three questions assessed the urge for rash action (e.g., "Right now, I am tempted to do something that could get me into trouble."; modified from Sperry et al., 2018) and five questions assessed the urge for experiential avoidance (e.g., "I'm trying to distract myself from my feelings."; Hershenberg et al., 2017; Shahar & Herr, 2011). Each statement was rated on a 0 (*Not at all*) to 6 (*Extremely*) scale.

Momentary Self-Efficacy. Momentary willpower and distress intolerance were assessed using questions previously validated in EMA studies (Veilleux et al., 2018a; Veilleux, Skinner, et al., 2021). Two prompts inquired about momentary willpower: 1.) "Right now, I have ____ willpower", 2.) "If I had to do a task right now that required significant self-control, I would be successful at that task" (Veilleux et al., 2021). The first question had the response options of 0 (*Zero*) to 6 (*Extremely high*), and the second question had options of 0 (*Strongly disagree*) to 6 (*Strongly agree*). The Momentary Distress Intolerance Scale (Veilleux et al., 2018) was used to assess momentary distress intolerance. Items included: 1.) "I want to stop what I'm doing right now so I can feel better," 2.) "Right now, my emotions are getting in my way," and 3.) "I can

keep doing what I'm doing right now, regardless of how I feel" (reverse scored). Responses were rated on a scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

Momentary Measures assessed via Follow-Up Prompts

Endorsement of feeling "Less distressed than usual (BETTER than usual)" or "More distressed that usual (WORSE THAN USUAL)" during a random or current emotion prompt triggered a follow-up prompt an hour later with six questions assessing endorsements of rash actions and rash inactions that took place after the prior emotional experience.

Rash Actions. Three questions adapted from Sperry and colleagues (2018) were used to assess rash actions. These included: 1.) "In the last hour, I said or did things that I wish I hadn't.", 2.) "In the last hour, I did something risky.", and 3.) "In the last hour, I acted without thinking." Participants rated their endorsement of each statement on a 0 (*Not at all*) to 6 (*Extremely*) scale.

Rash Inactions. Three novel questions were created for this study to assess rash inaction. These included: 1.) "In the last hour, I avoided doing something that I probably should have done.", 2.) "In the last hour, I temporarily gave up on my goals.", and 3.) "In the last hour, I withdrew into myself." Participants rated their endorsement of each statement on a 0 (*Not at all*) to 6 (*Extremely*) scale.

Data Analytic Plan

To calculate power for EMA data, both sample size and estimated number of events were considered, with higher power being associated with increased measurement occasions per participant (Bolger et al., 2012). We conservatively estimated that participants would respond to 4 prompts per day over the course of the week (this takes into account an average compliance rate of 80%; Shiffman, 2009), resulting in approximately 28 observations per person. We also

estimated that, if 90% of the participants were retained, we would conclude the study with approximately 5,040 observations. Power curve graphs (Kleiman, 2017) created with the aforementioned inputs indicated that, with 0.9 power, small effect sizes (d = 0.2) would be able to be detected with an approximate 50% participant prompt completion rate.

To prepare the data, we first aggregated momentary responses (positive affect, negative affect, distress intolerance, willpower, experiential avoidance, rash action urges, and endorsements of rash inaction/rash actions at follow-up) at each time point for all random and current emotion prompts for each participant. Next, demographic characteristics and random response rates were calculated and compared by sample groups (community & subject pool participants). Additionally, differences between sample groups on aggregated momentary variables and individual difference variables were assessed. We then calculated between- and within-person correlations among momentary and individual difference variables, as well as intraclass correlation coefficients (ICCs) for the momentary variables. ICCs assess variance for the momentary variables. As suggested by Muthén (1997), ICCs above 0.1 are adequate for multilevel modeling. We elected to set significance at p <.01 due to the number of analyses conducted.

As is common with EMA, multi-level modeling was used for testing major predictions. Momentary, time-varying predictors (Level 1) were nested within individuals (Level 2) over time. Level 1 predictors were person mean centered to examine whether a person varied compared to their own average. Because person mean centering removes the individual difference variability, we also calculated a person average for each momentary predictor; this creates an individual difference variable (Level 2) from a Level 1 variable. Finally, baseline trait variables (ERBS, PID-5-SF) were grand mean centered.

Six models were run to test our predictions. First, we predicted that those with low emotion constraint scores would exhibit lower momentary distress intolerance and momentary willpower when experiencing stronger emotions than typical compared to those with high emotion constraint scores. To assess this, models included emotion constraint and within- and between-person affect variables as predictors of momentary distress intolerance (Model 1) and momentary willpower (Model 2). Cross-level interactions between emotion constraint and within-person affect were additionally included to explore emotion constraint as a moderator.

Second, we predicted that when individuals experienced stronger emotions than typical, 1.) low reward sensitivity (i.e., high detachment; low disinhibition) and high threat sensitivity (i.e., high negative affectivity) would be associated with experiential avoidance, and 2.) high reward sensitivity (low detachment; high disinhibition) and low threat sensitivity (low negative affectivity) would be associated with rash action urges. We additionally expected emotion constraint to moderate these relationships. Two models predicting experiential avoidance (Model 3) and rash action urges (Model 4) were constructed, each of which included within-person affect variables as Level 1 predictors, and emotion constraint and PID-5-SF negative affectivity, disinhibition, and detachment as Level 2 predictors. Momentary affect predictors were added to control for current affect and examine cross-level two- and three-way interactions of affect with emotion constraint and PID-5-SF variables.

Two final models tested the remaining predictions: that when individuals experienced stronger emotions than typical, 1.) low reward sensitivity (high detachment; low disinhibition) and high threat sensitivity (high negative affectivity) would be associated with rash inaction at follow-up, and that 2.) high reward sensitivity (low detachment; high disinhibition) and low threat sensitivity (low negative affectivity) would be associated with rash action at follow-up.

Two models predicting rash inaction at follow-up (Model 5) and rash action at follow-up (Model 6) were constructed, each of which included within-person affect, experiential avoidance, and rash action urges as Level 1 predictors, and between-person experiential avoidance and rash action urges, emotion constraint, and PID-5-SF negative affectivity, disinhibition, and detachment as Level 2 predictors. Momentary affect predictors were included to both control for current affect and to permit examination of cross-level two- and three-way interactions of affect with emotion constraint and PID-5-SF variables. Likewise, inclusion of Level 1 and Level 2 experiential avoidance and rash action urges predictors allowed for control of momentary and average levels of these variables in the models. Of note, we did not include between-person affect variables in Models 3-6, as we believed that the included PID-5-SF variables better captured these traits.

Results

Demographics combined across groups and variables combined across samples

Demographic characteristics and comparison by samples on aggregated variables from random and current emotion prompts are reported in Table 1. Participants in the subject pool were younger than community participants. Four participants did not provide their age. Overall, 72.6% (*n* = 143) of the sample identified as women, 25.8% (*n* = 51) as men, and 1.5% (*n* = 3) as "other" or did not want to report. Gender did not differ between community and subject pool samples. The combined sample was 67.5% White (*n* = 133), 10.7% Hispanic/Latino (*n* = 21), 6.1% Black (*n* = 12), 4.5% mixed raced or biracial (*n* = 9), 4% Asian/Asian American (*n* = 8), 4% reported as "other" (*n* = 8), 2% Native American (*n* = 4), and 1% Middle Eastern (*n* = 2). There were no differences between the percentage of White vs minority participants in the subject pool versus community sample.

Overall, participants completed 4996 random prompts at a completion response rate of 70%. Community participants had a higher response rate to random prompts than subject pool participants. Participants additionally completed 357 current emotion prompts. Participants indicated experiencing a level of distress more or less than usual 1,938 times (More distress: n = 1028; Less distress: n = 910), or for 36.2% of the total momentary prompts; these endorsements initiated follow-up prompts an hour later asking about engagement in rash action and inaction. Of the total 1,938 follow-up prompts, 1,329 were completed (68.5%). Community participants responded to 71.7% of the follow-up prompts. Subject pool participants completed 63.4% of their follow-up prompts. There were no differences between groups on momentary variables (positive/negative affect, experiential avoidance, rash action urges, distress intolerance and willpower) or trait variables (emotion constraint, PID-5-SF negative affectivity, detachment, and disinhibition).

Table 1. Demographic Characteristics and Comparison by Samples on Aggregated Variables from Random Prompts and Trait Measures

Variable	Overall	Community (n = 110)	Subject Pool (n = 87)	t	χ^2	p
Age	24.10 (8.26)	27.90 (9.02)	19.19 (3.02)	8.52		<.001
% Women	72.6%	79.8%	65.95%	--	5.40	.067
% White	67.5%	64.5%	71.3%	--	0.72	.397
Random prompt response rate	70.0% (18.0)	73.4% (17.4)	65.8% (17.9)	3.01	--	.003
Positive affect[a]	47.7 (16.1)	45.3 (16.0)	50.8 (15.8)	-2.47	--	.014
Negative affect[a]	16.4 (13.6)	17.5 (14.2)	15.0 (12.8)	1.28	--	.203
Experiential avoidance[a]	1.15 (1.07)	1.20 (1.05)	1.09 (1.09)	0.68	--	.499
Rash action urges[a]	1.08 (0.91)	1.19 (1.00)	0.95 (0.77)	1.90	--	.059
Distress intolerance[a]	2.60 (0.79)	2.62 (0.81)	2.57 (0.77)	0.42	--	.677
Willpower[a]	3.55 (1.03)	3.60 (1.06)	3.49 (0.99)	0.72	--	.476
Emotion constraint	2.45 (0.81)	2.50 (0.84)	2.38 (0.76)	1.07	--	.285
PID-5-SF Negative affectivity	1.36 (0.74)	1.43 (0.77)	1.27 (0.69)	1.51	--	.132
PID-5-SF Detachment	0.72 (0.55)	0.76 (0.51)	0.68 (0.61)	0.93	--	.356
PID-5-SF Disinhibition	0.93 (0.55)	0.90 (0.57)	0.96 (0.53)	-0.74	--	.461

Note. Means are presented with standard deviations in parentheses. PID-5-SF = Personality Inventory for *DSM-5* Short Form.
[a]Aggregated across entire week of EMA

Across emotion constraint strata (see Table 2), there were no differences in age (F(2, 190) = 1.17, p = .314) or in proportion of males, females, and individuals identifying as other gender (χ^2 = 1.75, p = .782). The percentage of individuals identifying as an ethnic minority also did not differ between emotion constraint strata (χ^2 = 6.36, p = .042). However, differences in experiential avoidance (F(2, 194) = 6.21, p = .002) were found between emotion constraint strata, such that those in the low (M = 0.88) and middle strata (M = 1.08) reported lower experiential avoidance than those in the high stratum (M = 1.53). Furthermore, PID-5-SF

negative affectivity ($F(2, 194) = 5.31$, $p = .006$) and PID-5-SF disinhibition ($F(2, 194) = 5.08$, $p = .007$) differed across emotion constraint strata; higher negative affectivity was reported in the high stratum ($M = 1.61$) compared to the low ($M = 1.20$) and middle ($M = 1.29$) strata, and higher disinhibition was reported in the high stratum ($M = 1.09$) than in the low stratum ($M = 0.77$).

Table 2. Demographic Characteristics and Comparison by Emotion Constraint Strata on Aggregated Variables from Random Prompts and Trait Measures

Variable	Low	Medium	High	*F*	χ^2	*p*
Age	24.2 (8.72)	23.1 (7.54)	25.3 (8.62)	1.17	--	.314
% Women	74.6%	72.4%	70.7%	--	1.75	.782
% White	76.2%	69.7%	55.2%	--	6.36	.042
Random prompt response rate	69.4% (17.6)	71.0% (16.3)	69.4% (20.6)	0.18	--	.834
Positive affect[a]	47.2 (16.9)	48.2 (16.1)	47.5 (15.7)	0.08	--	.924
Negative affect[a]	13.8 (10.4)	15.9 (13.0)	19.8 (16.7)	3.02	--	.051
Experiential avoidance[a]	0.88 (0.84)	1.08 (1.06)	1.53 (1.20)	6.21	--	.002
Rash action urges[a]	0.99 (0.79)	1.12 (0.89)	1.14 (1.05)	0.46	--	.633
Distress intolerance[a]	2.40 (0.72)	2.59 (0.76)	2.81 (0.86)	4.03	--	.019
Willpower[a]	3.83 (1.03)	3.40 (1.03)	3.44 (0.98)	3.53	--	.031
Emotion constraint	1.57 (0.24)	2.40 (0.32)	3.46 (0.36)	566.1	--	<.001
PID-5-SF Negative affectivity	1.20 (0.70)	1.29 (0.72)	1.61 (0.74)	5.31	--	.006
PID-5-SF Detachment	0.66 (0.57)	0.74 (0.55)	0.77 (0.55)	0.60	--	.552
PID-5-SF Disinhibition	0.77 (0.54)	0.93 (0.51)	1.09 (0.58)	5.08	--	.007

Note. Means are presented with standard deviations in parentheses. PID-5-SF = Personality Inventory for *DSM-5* Short Form.
[a]Aggregated across entire week of EMA

Zero-order correlations among variables are reported in Table 3, with between-person correlations below the diagonal and within-person correlations above the diagonal for the

momentary variables only. ICCs are also reported along the diagonal; they ranged between 0.32 and 0.54, reflecting within-person variability as expected for momentary variables.

Greater momentary distress intolerance and lower willpower were associated with lower positive affect and higher negative affect at both within- and between-person levels. Furthermore, greater momentary distress intolerance was associated with lower momentary willpower at both the within- and between-person levels. These findings are consistent with previous ecological momentary assessment studies (see Veilleux et al., 2018, 2021). The reported relationships between higher experiential avoidance and lower positive/higher negative affect were also consistent with past research (see Ellis et al., 2022).

Several reported relationships between momentary and person-level variables are novel to this study. Higher positive affect was associated with lower levels of both PID-5-SF negative affectivity and detachment, and higher negative affect was associated with greater emotion constraint and greater PID-5-SF negative affectivity, detachment, and disinhibition. Both experiential avoidance and rash action urges were positively associated with PID-5-SF negative affectivity, detachment, and disinhibition. Higher experiential avoidance was additionally associated with greater emotion constraint. Momentary distress intolerance and momentary willpower were both associated with PID-5-SF negative affectivity and disinhibition as well as emotion constraint. Results additionally indicate differences between rash inactions and rash actions reported at follow-up: while greater rash inactions were associated with higher PID-5-SF negative affectivity, detachment, and disinhibition, greater rash actions were only associated with higher PID-5-SF negative affectivity and disinhibition. Greater rash actions were additionally associated with greater emotion constraint.

Table 3. Between Person and Within Person Correlations among Daily Variables and Individual Difference Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Positive affect	*.44*	-.53**	-.38**	-.20**	-.49**	.33**	-.31**	-.20**	n/a	n/a	n/a
2. Negative affect	-.33**	*.52*	.51**	.32**	.49**	-.27**	.31**	.24**	n/a	n/a	n/a
3. Experiential avoidance	-.33**	.81**	*.53*	.39**	.43**	-.21**	.29**	.18**	n/a	n/a	n/a
4. Rash action urges	-.37**	.69**	.65**	*.51*	.27**	-.21**	.34**	.22**	n/a	n/a	n/a
5. Distress intolerance	-.32**	.74**	.73**	.52**	*.32*	-.31**	.31**	.21**	n/a	n/a	n/a
6. Willpower	.42**	-.45**	-.43**	-.45**	-.56**	*.41*	-.23**	-.14**	n/a	n/a	n/a
7. Rash inactions	-.39**	.62**	.58**	.67**	.49**	-.40**	*.54*	.35**	n/a	n/a	n/a
8. Rash actions	-.13	.65**	.51**	.59**	.52**	-.32**	.48**	*.54*	n/a	n/a	n/a
9. Emotion constraint	-.03	.22**	.29**	.11	.25**	-.20**	.18	.23**	--	n/a	n/a
10. PID-5-SF Negative affectivity	-.32**	.46**	.43**	.46**	.37**	-.34**	.36**	.32**	.23**	--	n/a
11. PID-5-SF Detachment	-.22**	.21**	.26**	.23**	.12	-.06	.25**	.06	.07	.31**	--
12. PID-5-SF Disinhibition	-.15	.42**	.42**	.46**	.33**	-.31**	.36**	.40**	.27**	.51**	.32**

Note. PID-5-SF = Personality Inventory for *DSM-5* Short Form (Maples et al., 2015). Between-person correlations are below the diagonal, and within-person correlations are above the diagonal for momentary variables only. Intraclass correlations for momentary variables are presented along the diagonal.
**p <.01.

Emotional control predicting momentary self-efficacy for managing emotions

Multilevel models evaluated whether emotional control predicted momentary distress intolerance and willpower. Table 4 presents results for the models assessing momentary distress intolerance (Model 1) and momentary willpower (Model 2) as outcome variables. In moments where positive affect was lower and negative affect was higher than usual, participants reported greater momentary distress intolerance. In addition, at the person level, people who generally experienced higher negative affect also reported greater distress intolerance. Model interactions did not reveal a significant relationship between emotion constraint and momentary positive affect; however, the relationship between momentary negative affect and momentary distress intolerance was moderated by emotion constraint, such that the relationship between negative affect and distress intolerance was stronger among those lower in emotion constraint (see Figure 1).

In moments where positive affect was higher and negative affect was lower than usual, participants reported greater momentary willpower (Model 2). At the person level, people who generally experienced higher positive affect and lower negative affect also reported greater momentary willpower. Model interactions revealed that the relationship between momentary positive affect and momentary willpower was moderated by emotion constraint, such that the relationship between positive affect and willpower was stronger among those with greater emotion constraint (see Figure 2). The distinctions were particularly evident when positive affect was low: people with low emotion constraint tended to report higher willpower when feeling less positive than usual to a stronger degree than people with high emotion constraint.

Table 4. Summary of Fixed Effects for Multilevel Models Predicting Momentary Distress Intolerance and Momentary Willpower

Predictors	Momentary distress intolerance (Model 1)				Momentary willpower (Model 2)			
	B	*SE*	*t*	*p*	*B*	*SE*	*t*	*p*
Fixed effects								
Intercept	2.14	.15	14.59	<.001	3.06	.24	12.51	<.001
Momentary positive affect	-.02	.00	-23.30	<.001	.02	.00	16.90	<.001
Momentary negative affect	.03	.00	24.20	<.001	-.01	.00	-8.67	<.001
Person-level positive affect	-.00	.00	-1.69	.092	.02	.00	4.58	<.001
Person-level negative affect	.04	.00	13.18	<.001	-.02	.00	-4.88	<.001
Emotion constraint	.07	.05	1.52	.129	-.16	.08	-2.00	.05
Momentary positive affect*Emotion constraint	.00	.00	1.35	.178	.00	.00	3.53	<.001
Momentary negative affect*Emotion constraint	-.00	.00	-2.97	.003	.00	.00	1.66	.098
Random effects								
Marginal R^2	.399				.197			
Conditional R^2	.535				.489			

Interaction between Momentary Negative Affect and Emotion Constraint on Momentary Distress Intolerance

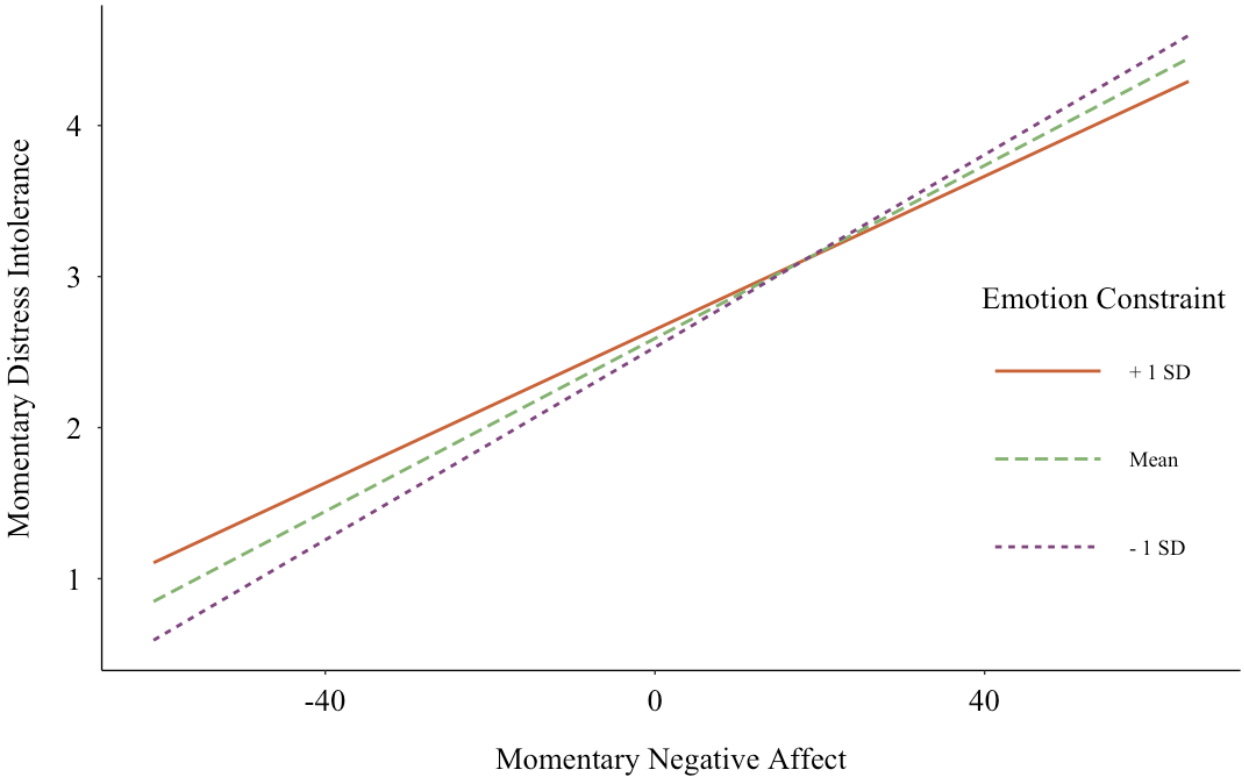

Figure 1. Interaction between momentary negative affect and emotion constraint on momentary distress intolerance.

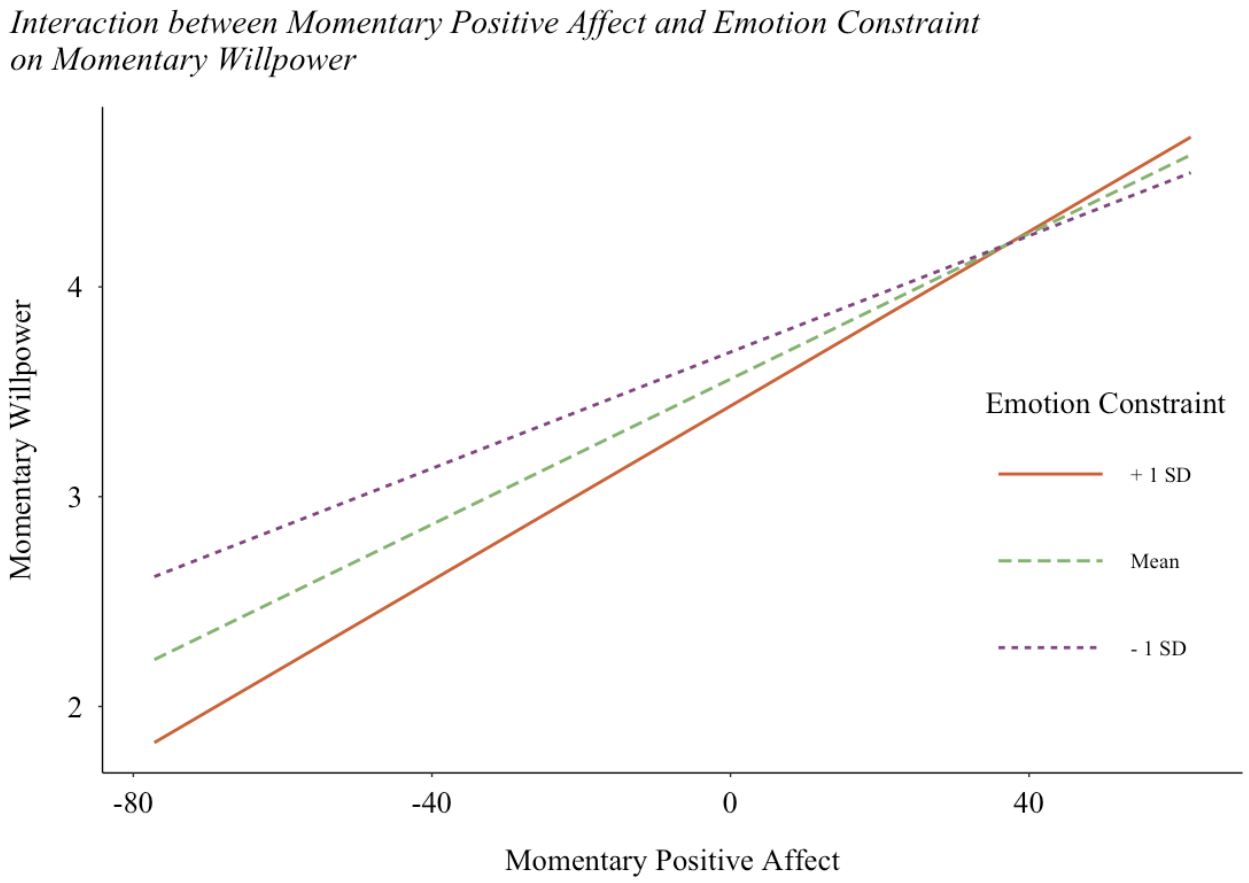

Figure 2. Interaction between momentary positive affect and emotion constraint on momentary willpower.

Emotional control predicting momentary action urges

Multilevel models were used to investigate how individuals with varying emotional control and sensitivities to threat and reward differ in experiential avoidance and rash action urges when experiencing heightened emotion. Results for these models are presented in Table 5.

In moments where positive affect was lower and negative affect was higher than usual, participants reported greater experiential avoidance (Model 3). Additionally, greater PID-5-SF negative affectivity and PID-5-SF disinhibition predicted greater experiential avoidance. Model interactions revealed that the relationship between momentary positive affect and momentary experiential avoidance was moderated by emotion constraint (see Figure 3). Emotion constraint

was particularly influential when people experienced lower positive affect than typical, as those with high emotion constraint experienced greater momentary experiential avoidance in these situations than those with low emotion constraint. The relationship between momentary positive affect, momentary experiential avoidance and emotion constraint was further qualified by PID-5-SF disinhibition, as evinced by a significant three-way interaction (see Figure 4). Among those with high disinhibition, lower positive affect was associated with greater experiential avoidance, regardless of the degree of emotion constraint. However, among those with low disinhibition, lower positive affect was associated with greater experiential avoidance to a stronger degree for those with high emotion constraint compared to those with low emotion constraint.

Interaction between Momentary Positive Affect and Emotion Constraint on Momentary Experiential Avoidance

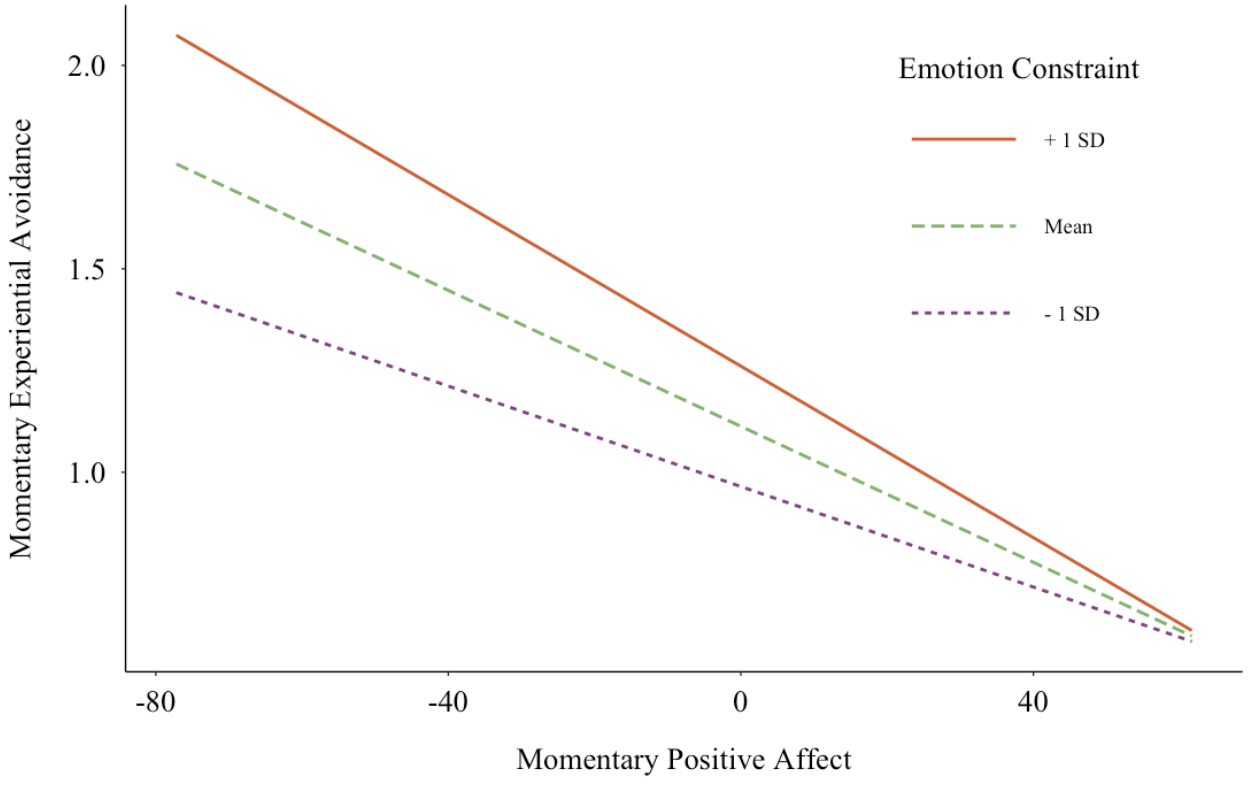

Figure 3. Interaction between momentary positive affect and emotion constraint on momentary experiential avoidance.

Table 5. Summary of Fixed Effects for Multilevel Models Predicting Average Experiential Avoidance and Rash Action Urges

Predictors	Experiential avoidance (Model 3)				Rash action urges (Model 4)			
	B	*SE*	*t*	*p*	*B*	*SE*	*t*	*p*
Fixed effects								
Intercept	1.11	.07	16.17	<.001	1.07	.06	18.36	<.001
Momentary positive affect	-.01	.00	-10.66	<.001	-.00	.00	-2.67	.008
Momentary negative affect	.03	.00	28.32	<.001	.02	.00	16.56	<.001
Emotion constraint	.19	.09	2.14	.033	-.06	.07	-.76	.450
PID-5-SF Negative affectivity	.33	.11	3.01	.003	.35	.09	3.80	<.001
PID-5-SF Disinhibition	.43	.15	2.89	.004	.51	.13	4.08	<.001
PID-5-SF Detachment	.25	.13	1.93	.053	.13	.11	1.19	.232
Momentary positive affect*Emotion constraint	-.00	.00	-2.84	.004	.00	.00	1.14	.256
Momentary positive affect*PID-5-SF Negative affectivity	-.00	.00	-1.96	.050	.00	.00	.04	.967
Momentary positive affect*PID-5-SF Disinhibition	.00	.00	.79	.432	-.00	.00	-2.01	.045

Momentary positive affect*PID-5-SF Detachment	-.00	.00	-1.20	.229	.00	.00	1.69	.091
Momentary negative affect*Emotion constraint	.00	.00	1.73	.084	.01	.00	3.51	<.001
Momentary negative affect*PID-5-SF Negative affectivity	.00	.00	.33	.739	.00	.00	2.16	.031
Momentary negative affect*PID-5-SF Disinhibition	.00	.00	.39	.698	-.00	.00	-.89	.373
Momentary negative affect*PID-5-SF Detachment	.00	.00	.35	.729	.00	.00	.53	.599
Emotion constraint*PID-5-SF Negative affectivity	.16	.13	1.22	.221	.07	.11	.59	.555
Emotion constraint*PID-5-SF Disinhibition	-.01	.17	-.06	.955	-.09	.15	-.64	.520
Emotion constraint*PID-5-SF Detachment	.13	.16	.83	.406	.10	.14	.76	.445

Momentary positive affect*Emotion constraint*PID-5-SF Negative affectivity	-.00	.00	-1.89	.058	.00	.00	.14	.892
Momentary positive affect*Emotion constraint*PID-5-SF Disinhibition	.01	.00	2.99	.003	.00	.00	.91	.362
Momentary positive affect*Emotion constraint*PID-5-SF Detachment	-.00	.00	-1.61	.108	-.00	.00	-1.21	.228
Momentary negative affect*Emotion constraint*PID-5-SF Negative affectivity	-.00	.00	-2.18	.029	-.00	.00	-.13	.899
Momentary negative affect*Emotion constraint*PID-5-SF Disinhibition	-.00	.00	-.45	.650	.00	.00	1.12	.262
Momentary negative affect*Emotion constraint*PID-5-SF Detachment	-.00	.00	-.67	.500	-.00	.00	-1.20	.229
Random effects								
Marginal R^2	.279				.205			

Conditional R^2	.668	.561

Note. PID-5-SF = Personality Inventory for *DSM-5* Short Form (Maples et al., 2015).

Interaction between Momentary Positive Affect and Emotion Constraint on Momentary Experiential Avoidance faceted by PID-5-SF Disinhibition

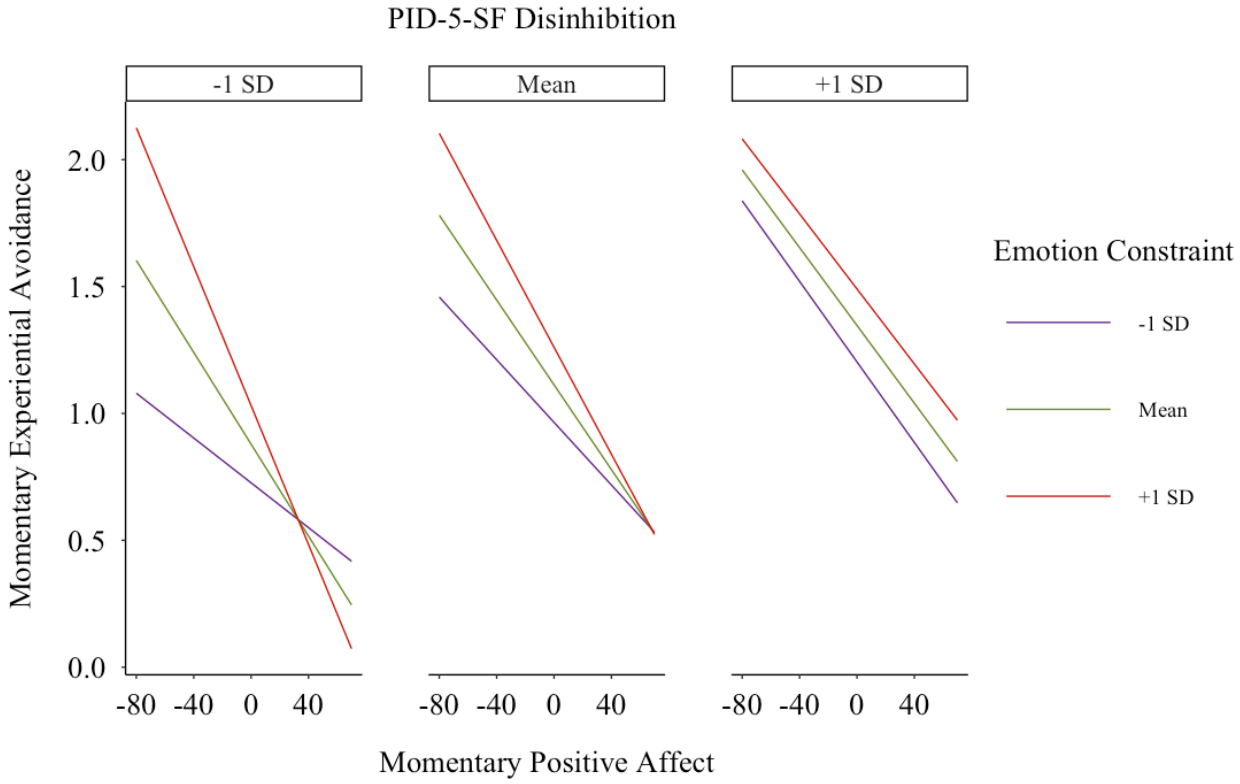

Figure 4. Interaction between momentary positive affect and emotion constraint on momentary experiential avoidance faceted by PID-5-SF disinhibition.

With respect to momentary rash action urges (Model 4), participants reported greater rash action urges in moments when momentary positive affect was lower and negative affect was higher than typical. Additionally, greater PID-5-SF negative affectivity and PID-5-SF disinhibition predicted greater rash action urges. Model interactions revealed that the relationship between momentary negative affect and momentary rash action urges was moderated by emotion

constraint. While rash action urges generally increased as momentary negative affect increased, the relationship between rash action urges and negative affect was stronger among those with high emotion constraint compared to those with low emotion constraint (See Figure 5). There were no significant three-way relationships.

Interaction between Momentary Negative Affect and Emotion Constraint on Momentary Rash Action Urges

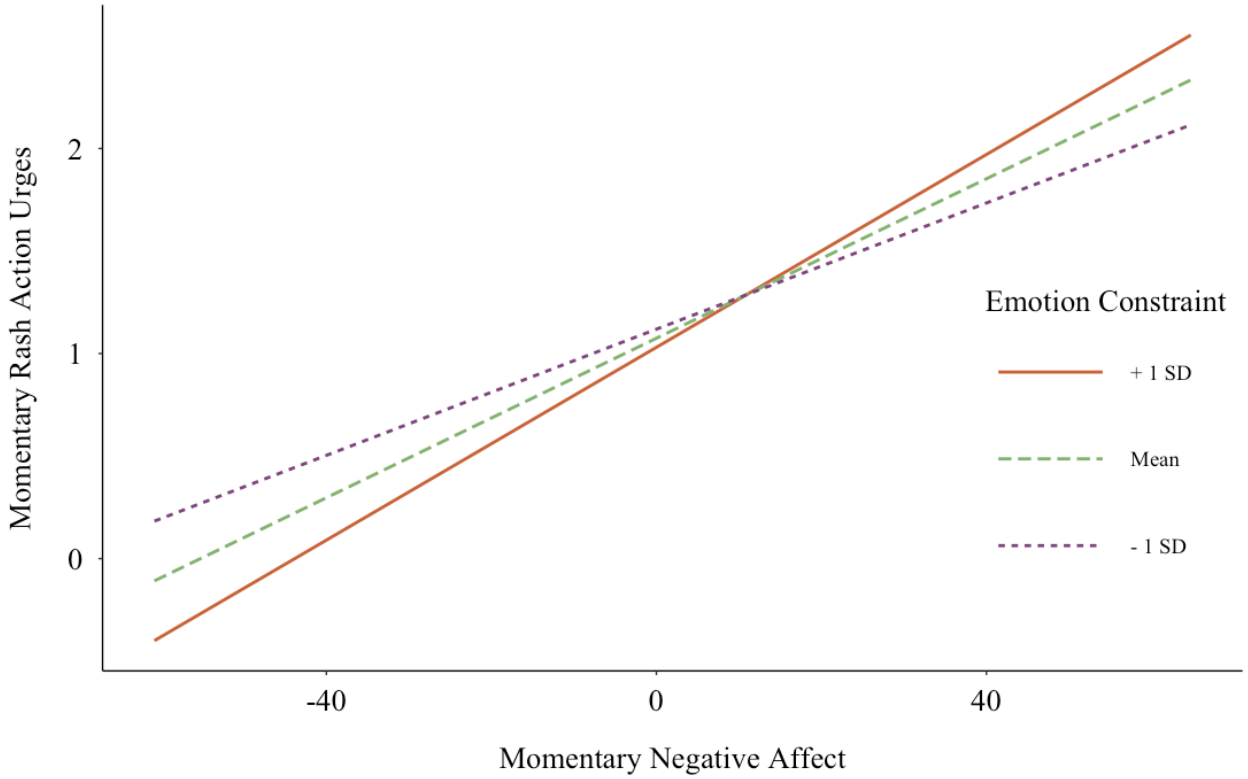

Figure 5. Interaction between momentary negative affect and emotion constraint on momentary rash action urges.

Emotional control predicting momentary actions

Finally, we investigated whether individuals with varying emotional control and sensitivities to threat and reward differ in rash actions (Model 5) and inactions (Model 6); these analyses examined follow-up reports of actual reported behavior. Results for these models are presented in Table 6.

Table 6. Summary of Fixed Effects for Multilevel Models Predicting Rash Inaction and Rash Action at Follow-Up

Predictors	Rash inaction (Model 5)				Rash action (Model 6)			
	B	*SE*	*t*	*p*	*B*	*SE*	*t*	*p*
Fixed effects								
Intercept	.42	.11	3.80	<.001	-.07	.09	-.83	.408
Momentary positive affect	-.01	.00	-4.13	<.001	-.00	.00	-1.37	.170
Momentary negative affect	.01	.00	4.30	<.001	.01	.00	4.21	<.001
Momentary experiential avoidance	.07	.04	1.69	.091	-.02	.03	-.70	.484
Momentary rash action urges	.30	.04	7.63	<.001	.15	.03	5.07	<.001
Person-level experiential avoidance	.27	.08	3.48	.001	.14	.06	2.31	.021
Person-level rash action urges	.73	.09	8.38	<.001	.42	.07	6.23	<.001
Emotion constraint	.06	.08	.73	.467	.06	.07	.87	.385
PID-5-SF Negative affectivity	.03	.10	.27	.791	-.04	.08	-.52	.604
PID-5-SF Disinhibition	-.05	.14	-.40	.692	.20	.11	1.85	.064
PID-5-SF Detachment	.24	.11	2.13	.034	-.13	.09	-1.44	.149
Momentary experiential avoidance*Emotion constraint	-.02	.04	-.54	.587	.00	.03	.00	.997
Momentary experiential avoidance*PID-5-SF Negative affectivity	-.03	.05	-.62	.538	-.03	.04	-.69	.492
Momentary experiential avoidance*PID-5-SF Disinhibition	.00	.06	.04	.970	.00	.05	.10	.919

Momentary experiential avoidance*PID-5-SF Detachment	.03	.06	.47	.636	.00	.04	.06	.954
Momentary rash action urges*Emotion constraint	-.00	.05	-.09	.927	.07	.04	1.83	.067
Momentary rash action urges*PID-5-SF Negative affectivity	.02	.05	.40	.689	-.02	.04	-.52	.602
Momentary rash action urges*PID-5-SF Disinhibition	-.15	.07	-2.20	.028	.05	.05	1.01	.315
Momentary rash action urges*PID-5-SF Detachment	-.01	.07	-.13	.894	-.21	.05	-4.08	<.001
Emotion constraint*PID-5-SF Negative affectivity	-.07	.12	-.57	.570	.06	.10	.58	.562
Emotion constraint*PID-5-SF Disinhibition	-.06	.15	-.38	.707	.19	.12	1.53	.126
Emotion constraint*PID-5-SF Detachment	.21	.14	1.43	.154	-.03	.11	-.31	.759
Momentary experiential avoidance*Emotion constraint*PID-5-SF Negative affectivity	.01	.06	.23	.817	.04	.05	.94	.349
Momentary experiential Avoidance*Emotion constraint*PID-5-SF Disinhibition	-.03	.08	-.40	.687	.05	.06	.87	.386
Momentary experiential avoidance*Emotion constraint*PID-5-SF Detachment	-.01	.08	-.07	.942	-.00	.06	-.08	.935

Momentary rash action urges*Emotion constraint*PID-5-SF Negative affectivity	-.02	.07	-.23	.818	-.04	.05	-.85	.395
Momentary rash action urges*Emotion constraint*PID-5-SF Disinhibition	-.08	.09	-.93	.351	-.14	.07	-2.04	.042
Momentary rash action urges*Emotion constraint*PID-5-SF Detachment	.11	.10	1.21	.228	-.19	.07	-2.70	.007
Random effects								
Marginal R^2 /	.469				.359			
Conditional R^2	.609				.545			

Note. PID-5-SF = Personality Inventory for *DSM-5* Short Form (Maples et al., 2015).

Following moments where positive affect was lower and negative affect was higher than usual, participants reported greater rash inactions. Additionally, participants reported greater rash inactions following moments where rash action urges were higher than usual. At the person level, people who generally reported higher experiential avoidance and higher rash action urges also reported greater rash inaction. There were no significant two-way or three-way relationships.

With respect to rash action, participants reported greater rash actions following moments where negative affect and rash action urges were higher than usual. At the person level, people who generally experienced higher rash action urges reported greater rash action at follow-up. Model interactions revealed that the relationship between momentary rash action urges and rash actions was moderated by PID-5-SF detachment (See Figure 6). Generally, greater rash action

urges were associated with greater rash action; this trend was stronger for those with low detachment compared to those with high detachment. Furthermore, there was a significant three-way interaction between momentary rash action urges, emotion constraint, and PID-5-SF detachment (see Figure 7). Among those with low detachment, greater rash action urges were associated with greater rash actions to a stronger degree for those with high emotion constraint compared to those with low emotion constraint. As levels of detachment increased, the impact of emotion constraint on the relationship between rash action urges and rash actions decreased.

Interaction between Momentary Rash Action Urges and PID-5-SF Detachment on Rash Actions

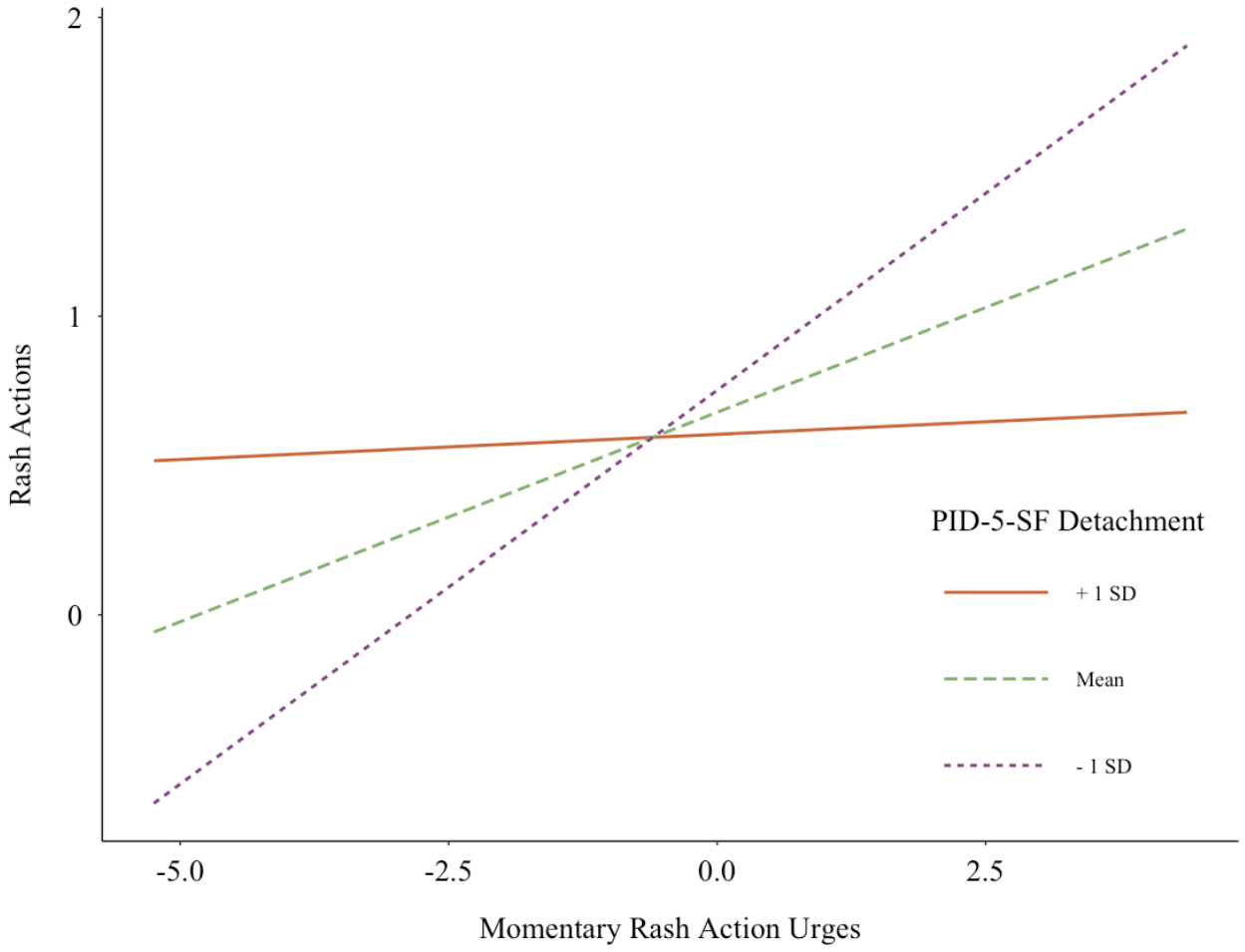

Figure 6. Interaction between momentary rash action urges and PID-5-SF detachment.

Interaction between Momentary Rash Action Urges and Emotion Constraint on Rash Action faceted by PID-5-SF Detachment

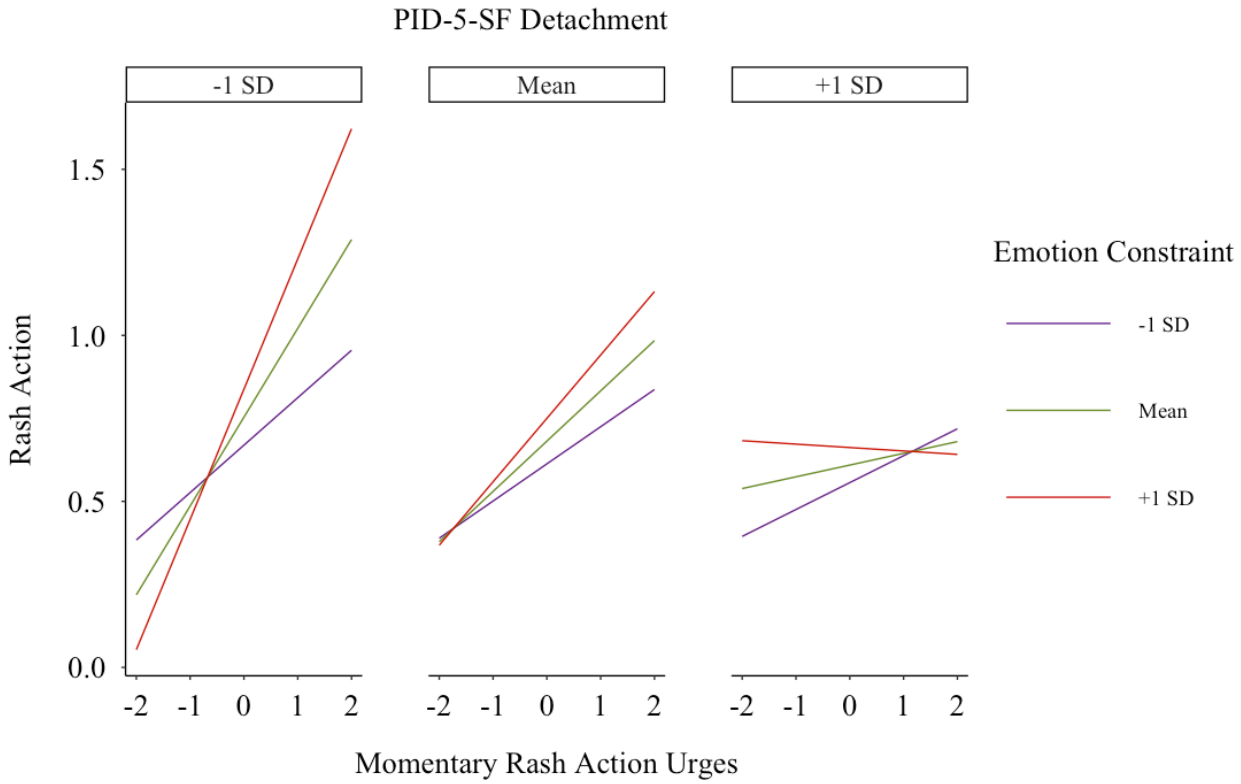

Figure 7. Interaction between momentary rash action urges and emotion constraint on rash action faceted by PID-5-SF detachment.

Discussion

The goal of the current study was to assess characteristics of emotion-related impulsivity that form the basis of the RRE framework by investigating the relationship between emotional control and emotion-related impulsivity in terms of feelings and action experienced in daily life. We first examined whether trait levels of emotional control predict momentary self-efficacy for managing emotion. We then examined how people with varying emotional control and sensitivities to threat and reward differ in momentary action responses to emotion as they go about their day. Taken together, our findings support the notion that perception of emotional

control is associated with momentary self-efficacy for managing emotion and provide partial support for the reflexive responding to emotion framework.

Does emotional control predict momentary self-efficacy for managing emotion?

Results from the current study replicate previous findings regarding momentary affect and self-efficacy for managing emotion and support our hypothesis that those with less emotional control exhibit decreased momentary self-efficacy for managing emotion in comparison to those with greater emotional control. We found that people reported greater momentary distress intolerance when experiencing lower positive affect or greater negative affect than usual and greater momentary willpower when experiencing greater positive affect or lower negative affect than usual. These findings are consistent with previous EMA findings (Veilleux et al., 2018, 2021) and underline the key role that emotions play in people's perceived ability to manage emotion.

Notably, relationships between momentary self-efficacy for managing emotion and momentary affect were impacted by trait levels of emotional control, but only for certain emotions. With respect to distress intolerance, our prediction that individuals with low emotional control would experience greater distress intolerance when feeling strong emotions was not supported. Rather, we found that people with low emotional control exhibited a *weaker* relationship between momentary negative affect and momentary distress intolerance than those with high emotional control. In other words, those with low emotional control were less sensitive to context (i.e., change in momentary negative affect) when reporting degree of distress intolerance. Contextual assessment has long been considered an important aspect of effective emotion regulation (Aldao, 2013; Folkman, 1984; Gross, 1998; Sheppes et al., 2014; Tamir, 2009). Shifting internal and external environments may call for respective shifts in regulation

strategies; lacking sensitivity to contextual changes could result in one essentially guessing which emotion regulation strategy would be most effective (Bonanno & Burton, 2013), which may ultimately increase chances of emotion dysregulation. Indeed, context sensitivity to negative emotion has been found to be associated with improvement with depression symptoms over time (Coifman & Bonanno, 2010). Thus, one possible explanation for our findings with respect to momentary distress intolerance is that individuals with greater endorsement of the belief that emotions are more powerful than the self—as consistent with those with low emotional control—may lessen the likelihood that such individuals adjust their emotion-regulation strategies for tolerating distress in response to shifting contexts.

With respect to willpower, we found that people with low emotional control exhibited a stronger relationship between momentary positive affect and momentary willpower than those with high emotional control, supporting our prediction that individuals with low emotional control would experience decreased momentary willpower when experiencing strong emotions (i.e., reduced positive affect). The impact of emotional control was especially apparent when momentary positive affect was below typical levels. Considering theory suggesting that positive emotions signal approach toward goals (Fishbach & Labroo, 2007), it may be that positive affect is a particularly motivating factor for those who believe they are constrained by their emotions. It likely follows that, as mood becomes increasingly negative in response to challenges or increasing task difficulty, individuals with low emotional control may see steeper declines in willpower over time than those with high emotional control. Taken together, our findings support the notion that perceptions of emotional control is associated with momentary self-efficacy for managing emotion, while highlighting how the valence of momentary emotions relates to context sensitivity among those that vary in emotional control.

Does emotional control predict momentary action urges and behaviors in response to experiencing strong emotions?

Our prediction that trait levels of emotional control would impact momentary action urges to stronger emotions than typical among those with varying sensitivities to reward and threat was only partially supported. In contrast to predictions, emotional control had minimal influence on the relationship between experiential avoidance and positive affect among people with high disinhibition (i.e., high reward sensitivity/low conscientiousness). Rather, it was among people with *low* disinhibition (i.e., low reward sensitivity/high conscientiousness) that emotional control had a stronger impact on the tendency for greater experiential avoidance to be associated with lower positive affect. One potential explanation for this finding is that disinhibition serves as a poor proxy for reward sensitivity (see limitations below). A second, alternative explanation is that high conscientiousness among those with low emotional control significantly heightens awareness emotion-related perceptions. It would follow that, with the absence of positive emotions, these individuals would feel fewer approach motivations and perhaps greater avoidance motivation accompanying greater aversion to risk.

With respect to urges for rash action, individuals with low emotional control experienced greater urges for rash action when experiencing greater negative affect than typical. It is seemingly the case that when individuals who feel powerless over their emotions experience negative emotion throughout the day, they are more likely to feel the urge to act rashly in response to these feelings. But do these urges result in rash behaviors at later time points?

While individuals reported greater rash inaction following moments where positive affect was lower and negative affect was higher than usual, our prediction that rash inaction would be significantly influenced by emotional control and sensitivities to threat and reward was not

supported. This finding, taken alongside our results indicating a significant impact of emotional control on experiential avoidance (i.e., rash inaction urges), suggests several possibilities. First, it may be that people are less aware of their rash inactions, and thus are less likely to report them. Second, our measurement of rash inaction may have failed to capture actual rash inaction in daily life. While we assumed that our questions (e.g., "In the last hour, I withdrew into myself.") were broad enough to assess a wide range of rash inactions, perhaps questions that address rash inaction more specifically (e.g., "In the last hour, I avoided my work by staying in bed") would result in a richer assessment. Third, it may be that the reflexive responding to emotion framework better predicts *urges* for rash inaction for those with low emotional control and high threat/low reward sensitivity than actual rash inaction. Future work aiming to better define and assess rash inaction is thus called for.

Notably, individuals did endorse greater rash inaction after experiencing above average rash action urges but not experiential avoidance. While this finding was not directly predicted, it does align well with authors' observations in clinical settings. It is not farfetched to imagine that for some individuals, experiencing urges for rash action could encourage withdrawal, as such urges may be feared due to their potential cost. For example, one may self-impose isolation after feeling the urge to kick a friend, knowing that such an attack would damage their relationship. It is clear that the complex interplay between urges, rash behavior, and emotional control is ripe for future research.

With respect to rash actions, individuals reported greater rash actions following moments where negative affect and rash action urges were higher than what was typical for them. Furthermore, those who generally experienced greater rash action urges also reported greater rash action afterwards. We also found that emotional control and trait detachment did have a

significant impact on the relationship between rash action urges and actual rash actions. For individuals with low detachment (i.e., high reward sensitivity/hedonic capacity), emotional control had a stronger impact on the tendency for greater rash action to be associated with higher momentary urges for rash action. This finding suggests that among those characteristically high hedonic capacities/approach motivation, the perception that emotions are more powerful than the self may lead to notable difficulties with inhibiting rash/approach-oriented urges.

Taken together, the results from the current study contribute to our understanding of how dispositional measures predict momentary endorsements of emotion-related impulsivity. Existing research assessing emotion-related impulsivity highlights potential discrepancies between dispositional and momentary measures (e.g., Feil et al., 2020; Sharpe et al., 2020; Sperry et al., 2016, 2018b), prompting the notion that dispositional and momentary measures of emotion-related impulsivity reflect unique processes (Sperry et al., 2021). Results from the current study suggest that, while the ERBS Emotion Constraint subscale (Veilleux et al., 2015) does not directly predict endorsements of rash urges and behaviors in response to stronger emotion than typical, levels of emotional control do influence the interplay between affect, rash urges and behaviors among those varying in trait detachment and disinhibition. Ultimately, these findings are partially consistent with the RRE framework proposed by Carver and colleagues (2008). In line with the model, individuals with lower control over their emotions and greater reward sensitivity were more likely to endorse engaging in rash action after experiencing the urge to do so. Furthermore, our results do not support the notion that lower emotional control in general results in more frequent occurrences of rash behavior, as emotional control alone did not predict rash urges or rash behaviors at follow-up in our models. This is consistent with the model's prediction that having heightened reactivity to emotional stimuli in the absence of low/high

reward/threat sensitivity should not lend itself to either vulnerability to internalizing or externalizing difficulties (Carver & Johnson, 2018).

Clinical Impressions

Clinically, our findings suggest that the ERBS emotion constraint subscale could be a useful tool for estimating how clients' self-efficacy for managing emotion may differ in response to daily changes in affect. For example, clients with low emotional control may be especially prone to perceiving themselves as having lower willpower when positive affect is less than typical; for these clients, interventions such as behavioral activation (Jacobson et al., 1996) that encourage engagement in adaptive behavior that may not necessarily be mood congruent could be especially beneficial. Our findings also indicate that those with low emotional control may experience greater urges for rash action when experiencing heightened negative affect. It is likely the case that such individuals would benefit from interventions that emphasize techniques for adaptively handling urges in the face of strong emotions. Recent research suggests that interventions aiming to improve emotion regulation, such as through dialectical behavioral therapy skills (Zapolski & Smith, 2017) or by utilizing self-calming techniques (Johnson et al., 2020), have been effective for lessening emotion-related impulsivity.

Limitations and Future Directions

The current study was not without limitations. First, approximately two thirds of our participants identified as White, and at least 44% of the sample were college students, limiting the generalizability of our results. However, the inclusion of a community sample in the current study did increase participant diversity, providing a contrast to existing momentary emotion-related impulsivity studies that only recruited college students in general psychology courses (e.g., Sperry et al., 2016, 2018). Future work recruiting more diverse samples and considering

effects related to developmental stages (such as differences between adolescents and adults; see Sperry & Woodward, submitted) would strengthen our understanding of the relationship between emotional control and emotion-related impulsivity. Second, while we were able to increase diversity by including community members, these participants were compensated differently than the subject pool participants (monetary compensation vs. course credit). Compensation differences could have influenced motivation to complete prompts, potentially explaining the higher response rates within the community sample. Third, it may be that personality facets as measured by the PID-5-SF poorly represent reward and threat sensitivity. Future studies testing hypotheses derived from the RRE model would benefit from utilizing a more direct measurement of dispositional reward and threat sensitivity, such as the Sensitivity to Punishment and Sensitivity to Reward Questionnaire, Short Form (SPSRQ-S; Cooper & Gomez, 2008). Fourth, data for this study was collected during the COVID-19 pandemic (August 2021-May 2022). It is unclear as to how the pandemic may have impacted findings.

While we consider our use of EMA to be a strength of the current study due to the increased ecological validity of our findings, limitations also accompany this methodology. Because our study was reliant on participants to report their feelings and behaviors as they went about their day, the possibility exists that certain events went unreported, or that strong emotions and subsequent urges for rash action/inaction occurred outside of the daily time parameters (i.e., between 9:30pm and 9:30am). It may also be the case that participants simply avoided responding to random prompts or voluntarily initiating current emotion prompts during certain moments of heightened emotionality, potentially lessening the richness of our data. To increase the chances of capturing heightened emotionality and the behaviors that followed, we designed the study to take place over course of a week. This not only provided ample observations for

assessing small effects, but also helps to address the relative paucity of longitudinal research assessing emotion-related impulsivity (Carver et al., 2017).

As mentioned, EMA is apt for investigating emotion-related impulsivity, as emotion-related impulsivity is considered an *if…then* process (Mischel & Shoda, 1995) that unfolds throughout the day. It follows that, in addition to individual differences, environmental contexts should influence the expression of emotion-related impulsivity. Here, we cast emotion-related impulsivity as generally maladaptive; however, we would be remiss to not consider that in certain environmental contexts, impulsive responses to emotion may be biologically *adaptive*. One avenue for future research would be to test predictions rooted in life history theory (Figueredo et al., 2005; Hill & Kaplan, 1999), which provides a framework for explaining how environmental risk factors/predictability influence individuals' resource allocation strategies for ensuring survival and reproductive success. Whereas individuals with slow life history strategies may be able to be more deliberative and future-oriented in their thinking and behaviors, individuals with fast life history strategies likely utilize impulsivity as a tool for taking advantage of opportunities as they arise in less predictable environments. Future research investigating for whom and in what contexts emotion-related impulsivity may be biologically adaptive (note: biologically adaptive does not necessarily mean devoid of psychopathological symptoms. See Hurst & Kavanagh, 2017) would be an important contribution to the development of culturally-sensitive interventions addressing negative impacts of emotion-related impulsivity.

Conclusion

In conclusion, the current study provides novel contributions to the growing body of literature on emotion-related impulsivity by investigating the relationship between dispositional emotional control and emotion-related impulsivity in daily life. Our findings support the notion

that perceptions of emotional control are associated with self-efficacy for managing emotion and provide partial support for the reflexive responding to emotion framework. Further, emotional control is identified as an important characteristic to screen for in clinical settings, as low emotional control may suggest heightened difficulty with self-efficacy for managing emotion and urges for rash action in response to affective fluctuations. While the current study provided an initial foray into understanding the relationship between emotional control and emotion-related impulsivity, continued investigation into this transdiagnostic factor of psychopathology is warranted.

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Appendix

Appendix 1. IRB Approval Letter

UNIVERSITY OF ARKANSAS

To:	Jennifer C Veilleux MEMH 312
From:	Justin R Chimka, Chair IRB Expedited Review
Date:	07/23/2021
Action:	**Expedited Approval**
Action Date:	07/23/2021
Protocol #:	1708015867R005
Study Title:	Emotion and Self-Regulation in Daily Life
Expiration Date:	08/04/2022
Last Approval Date:	08/05/2021

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Elise A. Warner, Investigator
Jeremy Clift, Investigator
Regina E Schreiber, Investigator
Kayce Corinne Hyde, Investigator
Danielle A Shaver, Key Personnel