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**Social Rejection Magnifies Impulsive Behavior Among Individuals with Greater
Negative Urgency: An Experimental Test of Urgency Theory**

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Abstract

Impulsivity is a multifaceted trait with substantial implications for human well-being. One facet of impulsivity is negative urgency, the tendency to act impulsively in response to negative affect. Correlational evidence suggests that negative affect magnifies impulsive behavior among individuals with greater negative urgency, yet causal evidence for this core pillar of urgency theory is lacking. To fill this gap in the literature, participants ($N=363$) were randomly assigned to experience social rejection (a situation shown to induce negative affect) or acceptance. Participants then reported their subjective negative affect, completed a behavioral measure of impulsivity, and reported their negative urgency. Among individuals with relatively high and average negative urgency, social rejection increased their impulsive behavior through greater experiences of negative affect. These indirect effects were not observed among individuals relatively low in negative urgency. These findings suggest that negative urgency exists at the nexus of urgent dispositions and situations that elicit negative affect, which offers novel support for urgency theory.

Keywords: negative urgency, negative affect, emotion, impulsivity, social rejection

Introduction

Impulsivity, once thought to be monolithic, comes in many forms. One of these facets, negative urgency, has proven uniquely potent in predicting problematic human behavior (Cyders & Smith, 2007, 2008; Smith & Cyders, 2016; Whiteside & Lynam, 2001). Negative urgency is characterized by impulsive behavior during the experience of negative affect. We aim to provide initial, causal evidence of urgency theory's central tenet: that impulsive acts committed by those with greater negative urgency are magnified by situations that elicit negative emotion.

What is Negative Urgency?

Situations that are characterized by negative affect can promote impulsive behavior (e.g., Chester et al., 2016). Yet people differ in their vulnerability to this effect, in the form of negative urgency (Whiteside & Lynam, 2001). Measurements of negative urgency often take the form of self-report items, such as "when I am upset I often act without thinking", and "when I feel rejected, I will often say things that I later regret" (Whiteside & Lynam, 2001). Thus, the core feature of negative urgency is conditional impulsivity, with the condition being the experience of negative affect. To date, there is a growing body of correlational evidence supporting this central tenet of urgency theory.

Urgent Impulsivity is Magnified by Negative Affect: Correlational Evidence

Negative urgency entails impulsive reactivity to subjective experiences of negative affect. For example, negative urgency is associated with obsessive behaviors, though only during greater experiences of distress (Coughe, Timpano, & Goetz, 2012). Negative urgency also predicts greater alcohol use, though only among those higher in depression (Karyadi & King, 2011). Negative urgency is also correlated with greater

alcohol intoxication, though only among individuals high in anxiety (Simons, Dvorak, Batién, & Wray, 2010).

Further correlational evidence suggests that *situations* characterized by negative affect can also increase impulsive behaviors among those with predispositions towards negative urgency. For example, individuals high in negative urgency exhibited greater laboratory aggression against their romantic partners, though only in response to conflict in their romantic relationship (Derefinko, DeWall, Metze, Walsh, & Lynam, 2011). Negative urgency was also associated with greater suicidal behavior, but only among individuals who experienced greater amounts of social rejection (Anestis & Joiner, 2011). The specificity of these correlational findings supports urgency theory's postulation that urgency only predicts impulsive behaviors in reaction to emotions (Cyders & Smith, 2008).

Despite the consistency of these findings, they are correlational in nature. As such, it remains uncertain whether urgent individuals' impulsive behavior is caused by aversive experiences, the opposite is true, or both. Also, it is unclear whether extraneous, confounding variables may drive the effect of aversive situations on negative urgency. Causal evidence for the effect of aversive situations on negative urgency is needed to address these issues, which requires experimental manipulation of the aversive nature of the situational context and subsequent measurement of the relation between negative urgency and impulsive behaviors. Yet what type of situation is likely to elicit such urgent impulsivity negative urgency?

Social Rejection: An Aversive, Urgency-Evoking Experience

Social rejection is an all-too-common feature of the human social environment (Nezlek, Wesselmann, Wheeler, & Williams, 2012). These experiences of thwarted belonging are profoundly distressing, painful, and aversive (e.g., Eisenberger, Lieberman, & Williams, 2003). Such experiences of social rejection elicit impulsivity from individuals high in negative urgency, though only demonstrated with correlational evidence (Anestis & Joiner, 2011). Thus, an experimental manipulation of social rejection is likely to be an effective test of whether urgent individuals' impulsive behavior is causally-increased by situations characterized by negative affect.

Overview

Urgency theory holds that the impulsive acts of those with greater negative urgency is not a constant state, but exists in response to affective features of the environment (Cyders & Smith, 2008). In the present research, we predicted that an experimental induction of social rejection would interact with negative urgency to predict greater impulsive behavior. Adding mechanistic specificity, we predicted that this interactive effect between negative affect and negative urgency on impulsive behaviors would be mediated by greater subjective negative affect.

Methods

Participants

Participants were 363 undergraduates (250 females, 109 males, 4 missing gender data; age: $M = 18.65$, $SD = 0.98$, 8 missing age data) who received course credit for their participation. Although four participants were missing race and ethnicity data, we observed that the sample was 75.8% White, 11.7% Black, 8.0% 'Other', and 3.9% Asian, 0.6% Native American. Of the sample, 4.7% reported Hispanic ethnicity.

Materials

International Personality Item Pool. The 120-item version of the International Personality Item Pool measures individuals' Big Five personality trait dimensions: agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience (Goldberg, 1999; Goldberg et al., 2006). This measure was included in order to control for the inherently greater negative affectivity (i.e., neuroticism) among individuals high in negative urgency (as in Chester et al., 2016).

Need Threat Scale. The 30-item Need Threat Scale assesses the aversive experience of social rejection (Williams, 2009), including the degree to which the rejection incident threatened the fundamental human needs for belongingness, self-esteem, control, and meaningful existence. The scale also measures the impact of the rejection event on current negative affect and serves as an explicit manipulation check of perceived rejection.

UPPS-P impulsivity scale. The UPPS-P impulsivity scale (Lynam, Smith, Whiteside, & Cyders, 2006; Whiteside & Lynam, 2001) includes 59 items, scored by averaging item-responses along on a 4-point Likert-style scale. The items assess five facets of impulsive behavior: negative urgency, lack of premeditation, lack of perseverance, sensation seeking, and positive urgency.

Procedure

Participants arrived at a psychology laboratory in groups of 1 to 4, where they were seated at individual cubicles in front of a computer. Each individual participant was randomly assigned to experience negative ($N = 179$) or neutral affect ($N = 184$). The affect manipulation took the form of a social rejection paradigm that reliably increases

negative affect, called Cyberball (version 4.0; Williams, Cheung, & Choi, 2000; Williams, Yeager, Cheung, & Choi, 2012). Participants were told that the purpose of the task was to practice their ability to mentally visualize events, which took the form of a virtual ball toss game, which participants ostensibly played with two other same-sex undergraduates. Out of the 30 ball tosses preprogrammed into the game, participants were randomly assigned to receive either 10 tosses distributed equally throughout the task (acceptance condition) or just 3 tosses towards the beginning of the task and then no more while their partners passed the ball back and forth to one another (rejection condition). After the Cyberball task, participants completed the negative affect subscale of the Need Threat Scale, as well as a demographics questionnaire.

Participants then completed a behavioral measure of emotional impulsivity, an Emotional Go/No-Go task (as in Chester et al., 2016). Participants were instructed to press a keyboard button whenever they viewed the letter 'M' (Go trials) and to *not* press the button when they viewed the letter 'W' (No-Go trials). These letters were overlaid atop images from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008) that were selected based on pre-ratings of high, average, or low pleasantness to elicit positive, neutral, and negative affective valence, respectively (see Chester et al., 2016). The task thus possessed a 2 (response: Go vs. No-Go) by 3 (valence: negative vs. neutral vs. positive) within-subjects factorial design. Each trial began with a centered fixation cross with a randomized duration (1250ms, 1500ms, or 1750ms) to prevent participants from anticipating the trial onset. Then, the letter M or W appeared in the center of the screen overtop an image for 500ms. Participants completed 3 blocks of 60 trials each (180 trials total), with 20s rests in between. Of the

180 trials, 135 were Go and 45 were No-Go in order to make the “Go” response prepotent. Trials were split evenly among the three emotion conditions: 60 trials per emotion condition (45 Go, and 15 No-Go). Finally, participants completed a battery of personality questionnaires including the remaining items of the Need Threat Scale, the full UPPS-P Impulsivity Scale and International Personality Item Pool, were debriefed, and dismissed with thanks. This study was conducted in the context of a larger project on emotion, aggression, and impulsivity. As such, participants completed other tasks and questionnaires that are not reported here.

Results

Descriptive Statistics and Manipulation Checks

Eight participants failed to complete the International Personality Item Pool (one of which also failed to complete the UPPS-P Impulsivity Scale) and 26 participants failed to complete the Go\No-Go Task (four of whom also failed to complete the negative affect subscale of the Need Threat Scale). The negative urgency subscale of the UPPS-P Impulsivity Scale was sufficiently reliable (Cronbach’s $\alpha = .86$), as was the neuroticism subscale of the International Personality Item Pool ($\alpha = .86$), and all seven subscales of the Need Threat Scale (α s = .73 - .96). Participants showed substantial variability in negative urgency ($M = 2.28$, $SD = 0.63$, possible range = 1.00 – 4.00, observed range = 1.00 – 3.92). These experimental conditions did not show significantly different distributions of gender, $X^2 = 0.40$, $p = .842$, race, $X^2 = 5.08$, $p = .280$, or ethnicity, $X^2 = 1.82$, $p = .177$, nor did they differ in age or any of the five UPPS-P impulsivity facets, all t s < 1.20, p s > .234. Validating our negative affect manipulation, rejected participants reported greater indices of negative affect and rejection than their

accepted counterparts (Table 2). The results of these manipulation checks were not meaningfully affected if gender was included as a covariate, alongside the rejection manipulation.

Go\No-Go Task Performance

For each participant, we calculated the number of errors they made within each of the six conditions (i.e., not pressing the button during Go trials, pressing the button during a No-Go trial). Three participants had a number of overall commission errors (i.e., pressing the button during No-Go trials, a behavioral failure to inhibit a prepotent response) 3 *SDs* from the sample mean and were removed from all subsequent analyses. In order to compare task performance across task conditions, accuracy rates were then calculated by dividing each participant's number of correct trials by the total number of trials within each condition (Figure 1). Accuracy rates on the Emotional Go\No-Go Task were characterized by a main effect of cue-type such that accuracy rates were higher on No-Go trials than Go trials, $F(1,333) = 28.25, p < .001, \eta_p^2 = .08$. Further, the emotion condition also exerted a main effect on accuracy rates, such that the two emotion conditions had lower overall accuracy rates than did the neutral condition, $F(1,333) = 5.15, p = .024, \eta_p^2 = .02$. These two factors significantly interacted, such that effect of cue type was significantly stronger for negative trials, $F(1,333) = 27.86, p < .001, \eta_p^2 = .08$. On negative trials, individuals exhibited stronger inhibitory tendencies, as evidenced by higher No-Go and lower Go accuracy rates. This effect is consistent with research characterizing negative affect as an inhibitory state (Gable, Reis, & Elliot, 2000).

Moderated Mediation Modeling

Data were entered into a moderated mediation model, whereby we tested whether the effect of social rejection on Go/No-Go Task performance was mediated by subjective negative affect, and whether this indirect effect was moderated by negative urgency. To test this, we constructed a model using PROCESS, a macro for SPSS (Hayes, 2012). In this model, the negative affect manipulation was modeled as the independent variable, the number of errors from all 45 No-Go trials (across all three emotion conditions) were modeled as the dependent variable, negative affect subscale scores from the Need Threat Scale were modeled as the mediator, and negative urgency subscale scores from the UPPS-P Impulsivity Scale were modeled as the moderator of the direct effect and the *a* path of the indirect effect (PROCESS model 8; for an illustration of this conceptual model see Figure 2). Scores from the neuroticism subscale of the International Personality Item Pool was modeled as a covariate on the mediator, state negative affect, as neuroticism is reliably linked to alterations in negative affect and is confounded with negative urgency (as in Chester et al., 2016). All three emotion conditions of the No-Go trials were used to increase the power of the model. Using nonparametric, accelerated, and bias-corrected bootstrapping (5,000 re-samples), the macro yielded 95% confidence intervals around the indirect effect of negative affect on inhibitory errors at low (-1 *SD*), mean, and high ($+1$ *SD*) levels of negative urgency. Supporting our hypotheses, social rejection elicited a significant increase in inhibitory errors (i.e., impulsive behavior) through greater negative affect at high (95% confidence interval: .029, .802) and mean (95% confidence interval: .026, .574) levels of negative urgency, controlling for neuroticism. This indirect effect was absent at low (95% confidence interval: -.007, .513) levels of negative urgency (see

Figure 3 for individual path estimates). Replacing negative urgency with the other four UPPS-P impulsivity facets (lack of perseverance, lack of premeditation, positive urgency, sensation-seeking) as the moderator failed to reproduce the observed pattern of moderated mediation.

Discussion

Negative urgency is a particularly potent predictor of negative outcomes such as illicit substance abuse (Smith & Cyders, 2016). Research on this construct has greatly risen in the past decade. Despite this wealth of research on negative urgency and its clear utility as a predictive entity, there remains no experimental test of a central tenet of urgency theory, that urgent impulsivity is not tonic, but reactive to situations characterized by negative affect. The present research conducted just such a test.

In our study, participants experimentally-induced to experience social rejection showed greater behavioral impulsivity on an inhibitory computer task. This direct effect occurred through greater self-reports of negative affect, though only if they reported a high level of negative urgency. This finding supports the core framework of urgency theory, that urgent impulsivity is an individual difference that reflects how people respond emotionally to their environment (Cyders & Smith, 2008). By controlling for neuroticism, we can also cautiously assert that these findings are not merely an artifact of urgent individuals' generally greater levels of negative affect.

Our use of subjective negative affect as a mediator of the effect of our rejection manipulation on greater urgent impulsivity allowed us to obtain more empirical granularity. Further, the use of this mediator ensured that it was the aversive, distressing feelings of the rejection manipulation that increased impulsivity, and not

some other feature of the manipulation such as physiological arousal or cognitive impairment.

These findings mesh well with a larger literature, which demonstrates that experimentally-induced social rejection can induce urgent impulsivity. Adolescents who exhibit impulsive eating showed impulsive reactivity to the Cyberball task (Hartmann, Rief, & Hilbert, 2013), as did healthy controls on a delayed-discounting task (Lawrence, Allen, & Chanen, 2010). Cyberball-induced rejection even magnifies neural signatures of impulsive attention (Xu et al., 2016). Such rejection-based investigations of impulsivity appear to be a fruitful avenue for future research.

This study was limited in several important ways. First, we performed this experiment on college undergraduates who are not representative of a large portion of humanity. Future research should attempt to replicate these effects among diverse and clinical populations to test their strength and generalizability. Second, negative urgency was measured and not experimentally manipulated. Experimental inductions of urgency are possible (e.g., Cyders et al., 2010) and should be combined with experimental inductions of aversive situations to assess the causal role of urgency in affect-induced impulsivity. Third, we manipulated negative and neutral affect in this study, but not positive affect. Thus, it remains unknown whether negative affect induces urgent impulsivity, or if the valence of the affect does not matter and even hedonically pleasant affective experiences can motivate impulsivity among negatively-urgent individuals. Future research should include an additional positive emotion condition to assess this possibility. Fourth, our behavioral measure of impulsivity—inhibitory failures on an Emotional Go/No-Go Task—traded external validity to increase internal validity inherent

in a controlled laboratory setting. Withholding a button press on a computer does not, at face value, resemble more ecologically valid behaviors, such as refraining from excessive alcohol consumption, inhibiting the desire to binge and purge among individuals who struggle with disordered eating, or refraining from striking a provocateur. Future research should employ more 'real-world' measures of impulsive behavior to see if our effects replicate across these important outcomes. We also measured and did not experimentally manipulate the subjective experience of negative affect (i.e., the present study's mediator). As such, we are not able to causally claim that the experience of negative affect was the driving force behind the increase we observed in urgent impulsivity. Future research should experimentally manipulate and longitudinally measure negative affect in this mechanistic context to perform a more stringent test of our model.

Despite these limitations, our findings represent substantial support for the causal role of aversive situations in urgent impulsivity. Through such research, we hope to contribute to the understanding and reduction of rash and costly behaviors that individuals perform in response to their own feelings.

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Tables*Table 1. Zero-order correlations between study variables.*

	1	2	3	4	5	6	7	8	9	10	11	12
1. Go/No-Go Errors												
2. IPIP-Neuroticism	.14*											
3. NTS-Belonging	.12*	.18**										
4. NTS-Control	.06	.06	.57***									
5. NTS-Felt Rejection	.06	.06	.65***	.71***								
6. NTS-Meaningful Existence	.08	.24***	.73***	.62***	.67***							
7. NTS-Negative Affect	.13*	.21***	.30***	.16**	.22***	.26***						
8. NTS-Self Esteem	.11	.35***	.67***	.60***	.56***	.74***	.32***					
9. UPPSP-Lack of Perseverance	.17**	.34***	.06	.01	.03	.10	.16**	.18**				
10. UPPSP-Lack of Premeditation	.10	.05	-.03	-.04	-.02	.00	.09	.08	.63***			
11. UPPSP-Negative Urgency	.03	.44***	.13*	.02	.09	.15**	.19**	.22***	.48***	.43***		
12. UPPSP-Positive Urgency	.06	.29***	.05	-.06	.05	.06	.19**	.11*	.55***	.58***	.72***	
13. UPPSP-Sensation Seeking	-.05	-.27***	.00	-.04	-.03	-.13*	-.11*	-.14**	-.33***	-.07	-.04	-.05

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2. Manipulation check data from of the Need Threat Scale, by condition.

	Accepted <i>M (SD)</i>	Rejected <i>M (SD)</i>	Rejected > Accepted	<i>d</i>
Belonging Threat	2.38(0.81)	3.34(0.98)	$t(360) = 10.22^*$	1.08
Control Threat	2.95(0.81)	3.96(0.86)	$t(360) = 11.58^*$	1.22
Meaning Threat	2.32(0.82)	3.22(0.98)	$t(360) = 9.49^*$	1.00
Self-Esteem Threat	2.57(0.85)	3.18(0.91)	$t(360) = 6.56^*$	0.69
Negative Affect	1.82(0.69)	2.10(0.69)	$t(357) = 3.83^*$	0.41
Felt Rejection	1.71(1.00)	3.67(1.42)	$t(360) = 15.24^*$	1.61
% Ball Tosses	31.42(12.38)	8.50(6.72)	$t(353) = -21.59^*$	-2.30

* $p < .001$

Figure Captions

Figure 1. Means and standard errors of accuracy rates for each condition of the Emotional Go/No-Go Task. Each of these six means are significantly different from every other mean.

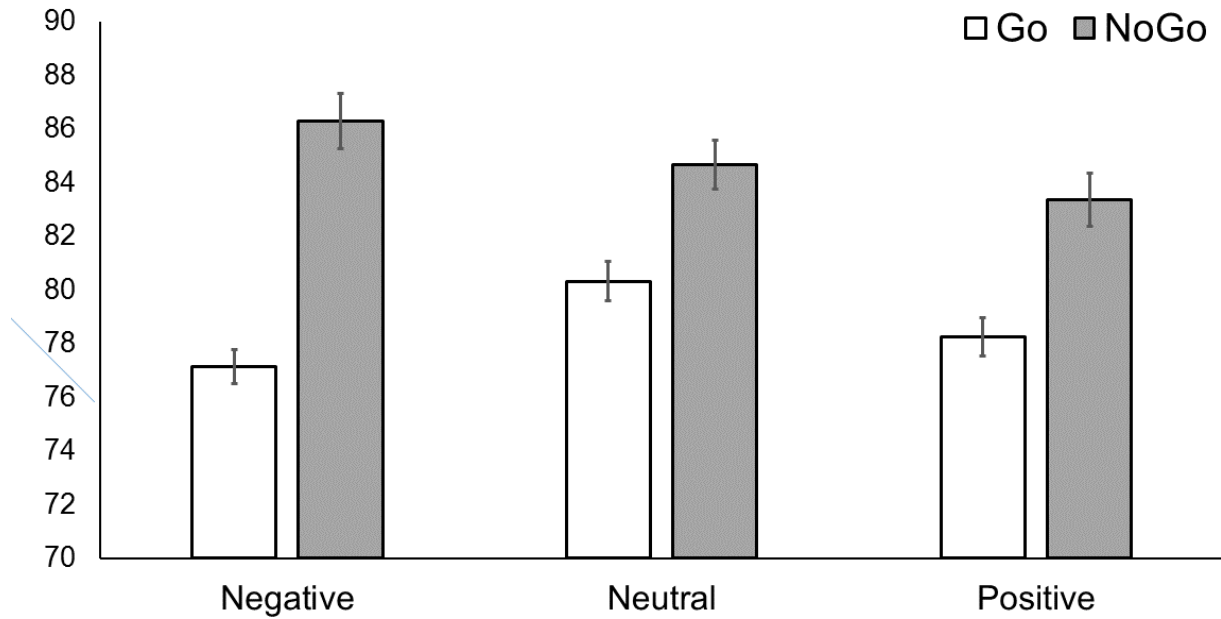


Figure 2. Conceptual moderated mediation model, whereby the effect of our negative affect manipulation on inhibitory errors is mediated by self-reported negative affect and this indirect effect is moderated by participants' negative urgency.

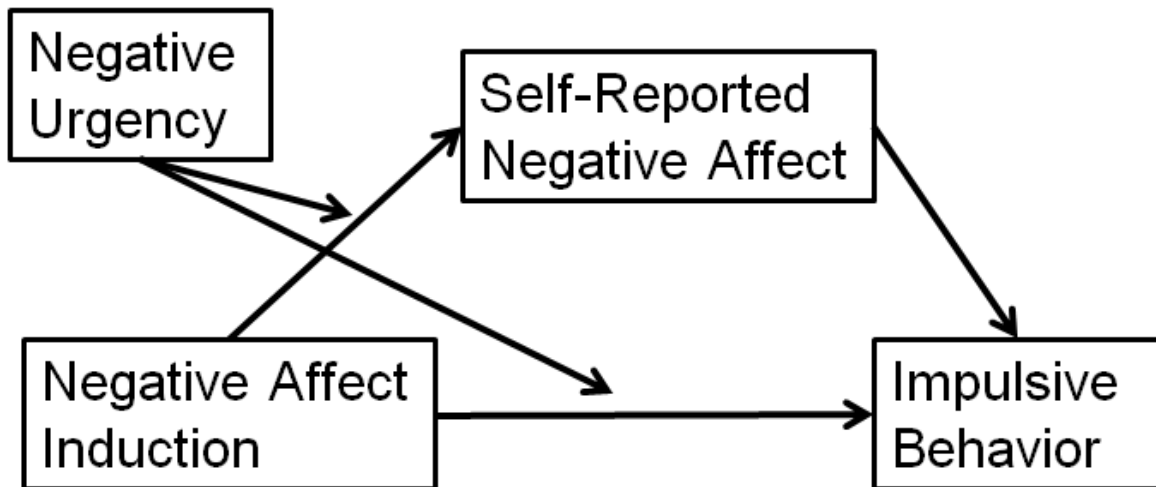


Figure 3. Moderated mediation model with unstandardized regression coefficients listed beside their corresponding analytic paths.

