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Impulsigenic Personality: Is Urgency an Example of the Jangle Fallacy?

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Abstract

Negative and positive urgency (the disposition to act rashly when in a highly negative or positive mood, respectively) have been identified as strong correlates of problem drinking and other addictive behaviors and potent predictors of subsequent drinking onset and increase (Peterson & Smith, 2017; Smith & Cyders, 2016). An unaddressed, important question about the validity of the urgency traits is whether they represent functionally distinct constructs or simply the interaction between lack of planning (the disposition to act rashly) and negative or positive affectivity (the disposition to experience negative or positive mood). If urgency is better represented by interactions between lack of planning and affect, there is no need for urgency risk models or separate urgency measures (Smith & Cyders, 2016). In a longitudinal adolescent sample, we tested whether (a) negative urgency differed from the interaction between lack of planning and negative affect, (b) positive urgency differed from the interaction between lack of planning and positive affect, and (c) each urgency trait predicted the subsequent onset of, and increases in, drinking behavior separately from the corresponding interaction. We found that (a) the corresponding interaction accounted for only 1–3% of the variance in negative or positive urgency, and (b) negative (or positive) urgency prospectively predicted drinking behavior but the corresponding interaction did not. These findings suggest that the urgency traits are distinct from interactions between affect and lack of planning.

Keywords

urgency; drinking; lack of planning; affect; construct validity

One impediment to rapid progress in clinical psychological science concerns the potentially inaccurate use of labels for psychological measures. Block's (1995) classic description of "jingle" and "jangle" fallacies is useful in this regard. The jingle fallacy refers to giving the same name to measures of different constructs, and the jangle fallacy refers to giving different names to measures that actually reflect the same construct. The possibility of both such fallacies bears investigation into research on the personality underpinnings to impulsive behavior.

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With respect to the jingle fallacy, it has been observed that numerous measures share the label “impulsivity,” even though the measures vary in content from short attention span, to acting without forethought, to seeking out novel and thrilling stimulation, to emotion-based dispositions to act rashly (Depue & Collins, 1999; Whiteside & Lynam, 2001). To the degree that multiple different psychological constructs are measured with instruments using the same name, empirical findings can be misconstrued, compromising theory development and clinical application effectiveness. One program of research into impulsigenic personality assessment has led to the identification of five separate traits that dispose individuals to rash or impulsive action (Cyders & Smith, 2007; Cyders et al., 2007; Whiteside & Lynam, 2001), thus highlighting the operation of the jingle fallacy in traditional assessment of impulsive personality.

Two of these five traits involve a disposition toward emotion-driven impulsive action: negative and positive urgency reflect the tendencies to act rashly when experiencing very negative and very positive emotion, respectively. They are facets of an overall urgency domain, and they involve high neuroticism, low agreeableness, and low conscientiousness (Cyders & Smith, 2007, 2008). Two of the traits are facets of a low conscientiousness domain: lack of planning reflects the tendency to act without forethought and lack of perseverance reflects difficulty maintaining a focus on tasks (Cyders & Smith, 2007). The fifth trait is sensation seeking, which reflects a disposition to seek out novel, thrilling stimulation; it falls on the extraversion personality domain (Cyders & Smith, 2007; Whiteside & Lynam, 2001).

Substantial evidence for the validity of the distinctions among the five traits has accrued. There is good evidence for discriminant validity among the traits when measured using the same method and clear convergent validity in trait assessment across methods (Cyders & Smith, 2007). The urgency, low conscientiousness, and sensation seeking domains share between 0% and 7% variance, and factor models specifying a single impulsivity dimension on which the traits load did not fit the data well (Smith et al., 2007). This result highlighted the need not to use the term “impulsivity” to refer to a personality disposition and instead to refer to the specific impulsigenic trait of interest.

Distinctions among the traits have proven useful in predicting and understanding rash or impulsive behavior. Whereas traits with the broad label of “impulsivity” related only marginally to bulimic behaviors (Stice, 2002), differentiation among impulsigenic traits showed that negative urgency relates strongly to bulimic behaviors but the other traits do not (Fischer, Smith, & Cyders, 2008). Whereas sensation seeking tends to predict frequency of alcohol consumption, negative and positive urgency predict quantity consumed and problems from drinking (Coskunpinar, Dir, & Cyders, 2013; Stautz & Cooper, 2013; Cyders, Flory Rainer & Smith, 2009). Negative urgency predicts the onset of non-suicidal self-injury and lack of perseverance predicts maintenance of that behavior (Riley, Combs, Jordan, & Smith, 2015). Negative urgency predicts and relates to bulimia nervosa status but positive urgency does not (Cyders et al., 2007; Davis & Smith, 2018). Lack of planning relates to school performance and the other traits do not (Smith et al., 2007). Identification of the operation of the jingle fallacy in impulsivity research has facilitated important advances in risk assessment.

The focus of this empirical report is on the possibility that the jangle fallacy is operating as well. The problems with operation of the jangle fallacy are clear. If researchers give a new name to a measure that is actually the same as an existing measure, separate programs of research can take place without recognition that the same construct is investigated in both, thus slowing advances in clinical psychological science. It is thus incumbent upon researchers using a new measure to address the jangle fallacy possibility, i.e., that the new measure is redundant with an existing measure.

The specific question addressed here is whether use of the terms negative urgency and positive urgency reflects the jangle fallacy. Multiple meta-analyses highlight negative urgency as strongly associated with multiple forms of addictive behavior (Berg, Latzman, Bliwise, & Lilienfeld, 2015, Coskunpinar et al., 2013; Fischer et al., 2008; Stautz & Cooper, 2013). Prospectively, negative urgency predicts subsequent drinking in adolescents (Peterson, Davis, & Smith, 2018), tobacco smoking in adults (Doran et al., 2013), bulimic symptoms in both adolescents and adults (Davis & Smith, 2018; Fischer, Peterson, & McCarthy, 2013; Pearson, Combs, Zapolski, & Smith, 2012), and self-harm in adults (Riley et al., 2015). Further, there is a well-developed neurobiological model of negative urgency, identifying reduced frontal cortex modulation of amygdala activity when distressed as resulting in rash action to meet immediate affective needs, without due consideration of one's ongoing interests and well-being (Cyders & Smith, 2008). A number of studies have provided evidence in support of this claim (see review by Smith & Cyders, 2016). Similarly, positive urgency predicts the onset of and increases in drinking in children and adolescents (Settles, Zapolski, & Smith, 2014), increases in the quantity of alcohol consumed and the resulting negative outcomes experienced by college students (Cyders, et al., 2009), and subsequent smoking behavior in children (Guller, Zapolski, & Smith, 2015).

Despite the evidence in support of the construct validity of both urgency variants, there is a compelling jangle fallacy hypothesis for these traits. Perhaps what is referred to as negative urgency (the disposition to act rashly when distressed) is really the combination of lack of planning (the disposition to act rashly) and negative affect (the disposition to experience negative mood). Similarly, perhaps positive urgency reflects simply the combination of lack of planning and positive affect. Although urgency theory holds that negative and positive urgency are distinct from those traits, reflecting specific emotion-driven tendencies to act rashly, it could certainly be true that the urgency measures actually reflect interactions between lack of planning and affect. If so, then use of the term urgency reflects the jangle fallacy. There would be no need for separate measures of urgency; instead, researchers could model the interaction of lack of planning with the respective affect. However, if negative and positive urgency are distinct from those interactions, there is reason to continue inquiry into negative and positive urgency and their role in impulsive behavior.

The Current Study

We tested the possible redundancy of negative urgency and the lack of planning x negative affect interaction (LPxNA) and of positive urgency and the lack of planning x positive affect interaction (LPxPA) using a longitudinal sample of adolescents (n = 1897) followed across eight waves of assessment from the last year of elementary school (age 11) through the first

year of high school (age 15). We did so in three steps. First, at each wave, we tested the degree of overlap between negative urgency and LPxNA and between positive urgency and LPXPA using simple, bivariate correlations. Second, we examined how much of the variance in negative urgency could be predicted cross-sectionally from lack of planning, negative affect, and their interaction, and how much of the variance in positive urgency could be predicted cross-sectionally from lack of planning, positive affect, and their interaction. Third, we tested the longitudinal prediction of drinking behavior using both the trait (negative or positive urgency) and the corresponding interaction (LPxNA or LPxPA) measures together to determine if either had incremental predictive validity over the other. This third step involved seven predictive tests, the first six spanning 6 months (e.g., from spring of 5th grade to fall of 6th grade) and the last spanning 12 months (from spring of 8th grade to spring of 9th grade). We measured drinking as simple drinking frequency, because that measure has the strongest concurrent association with alcohol use disorder symptoms in adolescence (Chung et al., 2012).

The advantages of using a large, longitudinal sample of youth to address the study question include the capacity to (a) test and compare concurrent and prospective predictive effects of negative, or positive, urgency and the LPxNA, or LPxPA, interaction; (b) examine the stability of associations across multiple time points; (c) test interaction effects with sufficient statistical power; and (d) examine these effects prior to the emergence of scar effects due to ongoing psychopathology (Widiger & Smith, 2008).

Method

Sample.

Participants were 1897 youth who were in 5th grade at the start of the data collection; they were drawn from urban, rural, and suburban backgrounds and represented 23 public schools in two school systems. The sample was equally divided between girls (49.9%) and boys. At wave 1, most participants were 11 years old (66.8%), 22.8 % were 10 years old; 10 % were 12 years old; and .2 % were either 9 or 13 years old. The ethnic breakdown of the sample was as follows: 60.9%, European American, 18.7% African American, 8.2 % Hispanic, 3% Asian American, and **8.8**% other racial/ethnic groups.

Measures.

In addition to a demographic and background questionnaire assessing gender, current age in years, and ethnic background, participants completed the following measures.

The UPPS-P Child Version

(Zapolski, Stairs, Settles, Combs, & Smith, 2010) was used to measure negative urgency, positive urgency, and lack of planning. Item responses are on a four-point Likert-type scale, ranging from “not at all like me” to “very much like me.” Scale scores were calculated as the mean item response. At wave 1, the spring of 5th grade, coefficient alpha estimates of internal consistency for negative urgency, positive urgency, and lack of planning were .85, . 89 and .77, respectively. Reliability estimates were slightly higher in succeeding waves.

The Positive and Negative Affect Schedule – Child Version

(PANAS-C; Laurent et al., 1999) measures positive and negative affectivity in children. It was based on the adult PANAS (Watson, Clark, & Tellegen, 1988) and developed and validated for children in grades 4–8. Items were adapted to ask how one "generally" feels rather than how one feels "over the past few weeks." There is impressive evidence for the scale's reliability and validity (Laurent et al., 1999). For both scales, the internal consistency estimate of reliability was $\alpha = .90$ at wave 1 and slightly higher at subsequent waves.

The Drinking Styles Questionnaire

(DSQ: Smith, McCarthy, & Goldman, 1995) provides a number of measures of drinking behavior; we chose to measure self-reported drinking frequency because it is the best marker of concurrent alcohol-related problems (Chung et al., 2012). Drinking frequency was measured at each wave, using a single item asking how often one drinks alcohol. A drink was defined as "more than just a sip or a taste. (A sip or a taste is just a small amount or part of someone else's drink or only a swallow or two. A drink would be more than that.)" Response choices are: 0 = "I have never had a drink of alcohol," 1 = "I have only had 1, 2, 3, or 4 drinks of alcohol in my life," 2 = "I only drink alcohol 3 or 4 times a year," 3 = "I drink alcohol about once a month," 4 = "I drink alcohol once or twice a week," and 5 = "I drink alcohol almost daily." This single item assessment has proven stable over time and there is good evidence for its construct validity (Guller, Zapolski, & Smith, 2015; Gunn & Smith, 2010; Settles et al., 2014).

Procedure.

Participants were recruited using a passive consent procedure. Parents of all potential participants received a letter, through the U.S. Mail, describing the study. Parents were asked to call a provided phone number or return an enclosed, stamped letter if they did not want their child to participate. In addition, youth had to assent to participate and sign an assent form at each wave. Out of 1,988 fifth graders in the participating schools, 1,897 participated in the study (95.4%). Reasons for not participating included (a) declination of consent by parents, (b) declination of assent by youth, and (c) youth language disabilities. Questionnaires were administered by study staff in the children's classrooms or in a central location, such as the school cafeteria, during school hours. It was made clear to the students that their responses on the questionnaire were to be kept confidential and no one outside of the research team would see them. The research team introduced the federal certificate of confidentiality for the project and emphasized that they were legally bound to keep all responses confidential. The questionnaires took 60 minutes or less to complete. This procedure was approved by the University's IRB and the participating school systems. Children who left the school system were invited to continue to participate. Those who consented did so either by completing hard copies of questionnaires delivered through the mail or by completing the measures on a secure web site. They were paid $30 for doing so. Participants completed the measures every 6 months from the spring of 5^{th} grade (the last year of elementary school) through the spring of 8^{th} grade (the end of middle school) and then again in the spring of 9^{th} grade.

Data Analyses

To construct the interaction terms of lack of planning by negative affect (LPxNA) and lack of planning by positive affect (LPxPA), we centered all three variables and then calculated the appropriate product terms. We then calculated cross-sectional bivariate correlations between key study variables at each of the eight waves of data collection to examine the degree of overlap between the urgency variants, lack of planning, positive and negative affect, and the interactions of interest (ie. LPxNA and LPxPA). To further examine overlap between these interactions and the urgency traits, we conducted regression analyses to test the cross-sectional prediction of negative urgency from lack of planning, negative affect, and their interaction, and the cross-sectional prediction of positive urgency from lack of planning, positive affect, and their interaction.

Following this, we performed hierarchical regression analyses to test the prediction of drinking behavior from negative urgency and the LPxNA interaction. Specifically, we sought to determine if either had incremental predictive ability above the other. As described above, this step involved seven predictive tests, spanning late elementary school to high school. For negative urgency, at step one, we entered gender and drinking frequency from the previous wave. At step two, we entered the main effects for lack of planning and negative affect. At step three, we entered the interaction term LPxNA. At step four, we entered negative urgency. Parallel analyses were run for positive urgency and the LPxPA interaction.

We repeated these regression analyses two different ways. The first analysis tested whether the predictive impact of the relevant urgency trait changed when the relevant interaction was dropped from the regression equations. The second tested the predictive impact when not controlling for prior drinking. We took this second step to determine whether prediction of drinking from negative urgency and LPxNA, or from positive urgency and LPxPA, reflected greater overlap between the trait and the corresponding interaction when there was more drinking variance to predict. All analyses were also run separately for boys and girls, the results of which are summarized in the text and presented in the online supplement (Tables S2–S9).

Results

Participant Retention

Table S1 (on-line supplement) provides retention data for the study. Retention from one wave to the next ranged from 92.4% to 99.2%, for an overall retention rate of 74.9% over eight waves. Youth who participated in all waves of the study did not differ from those who participated in fewer waves on any study variable. Therefore, we inferred that data were missing at random. Missing data were imputed using the expectation maximization (EM) procedure, which has been shown to produce more accurate estimates of population parameters than do other methods, such as deletion of missing cases or mean substitution (Enders & Peugh, 2004). As a result, we were able to make full use of the entire sample of n = 1897.

Descriptive Data

The top half of Table 1 presents drinking frequency over the eight waves of the study. Consistent with national epidemiological data, the percentage of youth engaging in drinking behavior increased steadily across the years from 5th grade through 9th grade. The bottom half of Table 1 presents mean and standard deviation values for negative urgency, positive urgency, lack of planning, negative affect, and positive affect by study wave.

Association between Negative Urgency and LPxNA, Positive Urgency and LPxPA

Table 2 provides correlations between key study variables at each wave of the study. Importantly, the median correlation between negative urgency and LPxNA across the eight waves was $r = .00$ and all were of trivial magnitude. Similarly, the median correlation between positive urgency and LPxPA across the eight waves was $r = .09$, with the highest correlation reflecting 3% shared variance. Table 3 provides results from eight hierarchical regression analyses for the interaction of negative affect and lack of planning predicting negative urgency. As the table shows, the main effects of lack of planning and negative affect reflect a moderate degree of variance shared with negative urgency across the seven waves (19 – 24%). By contrast, the interaction of the two shared almost no variance with negative urgency. The interaction did significantly predict negative urgency above the main effects at four of the eight waves; however, the variance accounted for by the interaction was minimal, at most only 1%. Table 4 provides analogous results for positive urgency. Here, too, there were small to moderate main effects of lack of planning and positive affect in the prediction of positive urgency, accounting for 9 – 10% of the variance across study waves. Again by contrast, although the interaction was a significant predictor of positive urgency at seven of eight waves, it accounted for 2% or less of the positive urgency variance. Results did not vary by gender for either positive or negative urgency.

Prediction of Drinking Behavior

Table 5 provides results of each of the seven longitudinal regression analyses for negative urgency. As the table shows, at no wave did LPxNA predict subsequent drinking frequency. At six of seven waves, negative urgency did predict drinking significantly. We ran two additional regression analyses; one for urgency uncorrected by LPxNA, and one not controlling for prior drinking. In the former, there was no difference in negative urgency beta weights controlled or not controlled for LPxNA through the second decimal point. Further, results did not vary when prior drinking was dropped from the original model, nor did results vary by gender.

Results were similar for positive urgency and LPxPA: the interaction effect did not predict subsequent drinking frequency at any wave. At four of seven waves, positive urgency did predict significantly. Table 6 provides full results for these analyses. Further, there was no difference in positive urgency beta weights controlled or not controlled for LPxPA through the second decimal point and results did not vary when prior drinking was dropped as a predictor, nor did results vary by gender.

Discussion

Investigation of the measurement of the personality underpinnings of rash or impulsive action has led to the important advance of identifying multiple different impulsigenic personality traits. A number of researchers have recognized distinctions within the impulsivity domain (Cyders & Smith, 2007; Depue & Collins, 1999; Evenden, 1999; Whiteside & Lynam, 2001). In the current study, we have relied on the empirical work by Whiteside and Lynam (2001) followed by Cyders and Smith (2007) that identified five separate impulsigenic personality traits. There does not appear to be a core, underlying impulsivity personality trait; rather, different impulsigenic traits share little variance and play different roles in the prediction of dysfunctional, impulsive action (Smith et al., 2007). Using the language of Block (1995), these advances can be understood as helping disentangle confusion due to the jingle fallacy, in which different constructs are given the same name.

The aim of the current paper was to address the opposite problem, in which the same trait is studied under more than one name (Block's jangle fallacy), which can also result in confused or inaccurate psychological theories. The traits of negative and positive urgency (a) are based on a developed neurobiological theory and (b) have proven particularly important in accounting for multiple addictive behaviors cross-sectionally and prospectively. However, no study has tested the viable possibility that negative urgency, the tendency to act rashly when distressed, is actually another name for the interaction of lack of planning (rash action due to lack of forethought) and negative affect. Similarly, no study tests whether positive urgency, the tendency to act rashly when in an elevated mood, is represented by the interaction of lack of planning and positive affect. If the urgency traits are not distinct from those interactions, there is no need for multiple terms or a theory of urgency.

In a sample of 1,897 adolescents, studied eight times from elementary to high school, we found a median correlation of $r = .00$ between negative urgency and the interaction of lack of planning and negative affect and a median correlation of $r = .09$ between positive urgency and the interaction of lack of planning and positive affect. Further, in regression analyses, only 1% of the variance in negative urgency was accounted for by LPxNA and only 3% of the variance in positive urgency was accounted for by LPxPA. It thus seems clear that negative urgency and positive urgency are distinct from interactions between lack of planning and the respective affect. This conclusion applies to both boys and girls. Urgency does not represent an example of the jangle fallacy, at least with respect to the above constructs.

We do note significant main effects of lack of planning and affect in the prediction of the urgency traits. Although negative and positive urgency do not reflect interactions of negative (or positive) affect and lack of planning, the urgency traits do share variance with those other variables.

There is theoretical and practical value to the distinction between negative urgency and LPxNA and positive urgency and LPxPA. One important challenge humans face is that of acting adaptively when highly emotional. Intense emotion can trigger immediate action in

response to the emotion, but such action can be ill-considered or rash. It appears that humans have an adaptive system, involving signals from the orbitofrontal cortex to other brain areas to interrupt such tendencies and choose actions designed to meet ongoing needs and goals (Carver, Johnson, & Joormann, 2008; Cyders & Smith, 2008; Davidson, 2003). Dysfunction in this system, thought to reflect elevations in urgency, is associated with multiple expressions of maladaptive responses to emotions (Smith & Cyders, 2016), and has even been hypothesized to underlie general psychopathology (Carver, Johnson, & Timpano, 2017). According to urgency theory, the trait of urgency reflects a dispositional deficit in this specific system; neurobiological evidence is emerging consistent with this idea (Smith & Cyders, 2016). Urgency is not simply a combination of general tendencies to act without forethought and to experience negative or positive affect. Had the current study showed redundancy between the urgency traits and the LPxNA and LPxPA interactions, there would have been reason to doubt this claim.

Concerning practical application, across 7 different time-lagged predictions spanning elementary school through the first year of high school, negative urgency consistently predicted subsequent increases in drinking behavior and LPxNA did not. Risk for early onset drinking in youth is not accounted for by the joint effect of lack of planning and negative affect, but is partly accounted for by elevations in the trait of negative urgency. Parallel results were found, and thus, similar conclusions may be drawn, for positive urgency and LPxPA. The same results were observed for both boys and girls. Drinking frequency, measured in youth, is an excellent marker of problem drinking (Chung et al., 2012). Urgency consistently predicted this marker beyond the effects of gender and prior drinking. Although these effects were small, the urgency traits do appear useful for this form of clinical risk assessment and are likely to matter at the population level. Because researchers have shown reciprocal predictive effects between the urgency traits and drinking behavior, such that each predicts increases in the other over time (Riley, Rukavina, & Smith, 2016), there are likely to be multiplier effects, such that even small effects lead to meaningful downstream changes in risk and behavior.

Limitations of this study include the following. Although we had good retention, and although retained and non-retained participants did not differ on study variables, we cannot know if results would have been different with better retention or complete data. We relied on self-report questionnaire assessment, so there was no opportunity to clarify questions as would be possible in an interview. The limitations of questionnaire assessment should be considered in the context of the many strengths of this approach: the measures we used rest on extensive bodies of evidence for their construct validity; we were able to include vastly more participants than would have been possible using face-to-face interviews; and participants respond privately, rather than having to admit to undesirable characteristics or behaviors to an interviewer, perhaps increasing report accuracy. Not surprisingly, drinking frequency in youth is positively skewed, although results did not differ using other forms of measurement, such as dichotomous drinker status. We measured gender dichotomously, so we have no information pertaining to youth with fluid gender identities or those undergoing gender transitions.

There is empirical evidence supporting the following claims in relation to the traits of negative and positive urgency. They are associated with reduced prefrontal modulation of affect- driven amygdala activity, they are distinct from other impulsigenic traits, and they predict the onset of, or increases in, problem drinking, binge eating, smoking, and non-suicidal self-injury (Smith & Cyders, 2016). The current study addressed the possibility that negative and positive urgency may represent the same variation among people as that captured by the interaction of lack of planning and trait-level affect. Results indicated that not to be the case. Negative and positive urgency merit assessment separate from other traits and appear useful for understanding risk for rash or impulsive action.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Public Significance Statement

Negative and positive urgency have been implicated in the research literature related to addictive and high-risk behaviors, but there are concerns that they represent interactions between negative affect and lack of planning, or positive affect and lack of planning, rather than being distinct constructs. This paper provides evidence over eight waves of longitudinal data that both urgency traits are distinct from and have predictive value over interactions between affect and lack of planning.

Table 1.

Descriptive Information

Frequencies of Drinking Behavior across the 8 Waves of Data Collection								
Drinking Frequency	**W1**	**W2**	**W3**	**W4**	**W5**	**W6**	**W7**	**W8**
I have never had a drink.	87.9%	88.5%	85.6%	82.7%	78.3%	68.9%	68.5%	53.3%
I have only had 1,2,3, or 4 drinks in my life.	10.4%	10.0%	12.1%	13.4%	16.2%	22.0%	21.7%	30.4%
I only drink alcohol 3 or 4 times a year.	0.6%	1.1%	1.3%	2.4%	3.3%	5.1%	5.6%	8.8%
I drink alcohol about once a month.	0.5%	0.2%	0.5%	0.7%	0.9%	2.3%	2.1%	4.1%
I drink alcohol once or twice a week.	0.4%	0.1%	0.2%	0.5%	0.6%	1.2%	0.9%	2.0%
I drink alcohol daily.	0.3%	0.2%	0.4%	0.3%	0.6%	0.6%	1.2%	1.5%

Mean and SD of Key Study Variables across the 8 Waves of Data Collection								
	W1	**W2**	**W3**	**W4**	**W5**	**W6**	**W7**	**W8**
Negative Urgency	2.21(.70)	2.11(.70)	2.15(.72)	2.19(71)	2.18(.72)	2.19(.69)	2.21(.70)	2.25(.66)
Positive Urgency	2.14(.74)	2.04(.76)	2.06(.79)	2.06(.78)	2.06(.80)	2.06(.77)	2.06(.77)	2.09(.72)
Lack of Planning	2.01(.55)	2.10(.58)	2.20(.60)	2.14(.57)	2.22(.57)	2.18(.52)	2.20(.56)	2.23(.53)
Negative Affect	2.11(.77)	1.83(.74)	1.75(71)	1.69(.74)	1.70(.70)	1.72(.68)	1.77(.75)	1.83(.76)
Positive Affect	3.73(.71)	3.56(.81)	3.61(.79)	3.42(.83)	3.41(.86)	3.38(.85)	3.40(87)	3.45(.78)

Note: n = 1,897. All variable scores reflect mean item scores.

Table 2.

Correlations between predictor variables at each wave

Wave 1							
	NU	**PU**	**LP**	**NA**	**PA**	**LPxNA**	**LPxPA**
NU	-						
PU	.63**	-					
LP	.36**	.31**	-				
NA	.37**	.35**	.11**	-			
PA	−.10**	−.02	−.26**	−.12**	-		
LPxNA	−.02	−.02	−.03	.03	.01	-	
LPxPA	.02	.05*	−.09**	.01	.15**	−.09**	-
Wave 2							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.67**	-					
LP	34**	.30**	-				
NA	.32**	.28**	.16**	-			
PA	−.08**	.01	−.26**	−.06*	-		
LPxNA	.00	.00	.05*	.13**	.05*	-	
LPxPA	.09**	.11**	−.09**	.04	.17**	.02	-
Wave 3							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.68**	-					
LP	.33**	.30**	-				
NA	.33**	.30**	.16**	-			
PA	−.10**	.04	−.26**	−.18**	-		
LPxNA	−.04	−.05*	.03	.14**	−.01	-	
LPxPA	.07**	.09**	−.07**	.01	.20**	−.24**	-
Wave 4							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.67**	-					
LP	.35**	.31**	-				
NA	.37**	.29**	.15**	-			
PA	−.18**	−.05*	−.20**	−.26**	-		

Wave 1							
	NU	**PU**	**LP**	**NA**	**PA**	**LPxNA**	**LPxPA**
LPxNA	.01	−.03	.04	.14**	−.01	-	
LPxPA	.08**	.18**	−.01	−.01	.13**	−.27**	-
Wave 5							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.67**	-					
LP	.30**	.29**	-				
NA	.37**	.28**	.18**	-			
PA	−.12**	.01	−.15**	−.17**	-		
LPxNA	−.04	.00	.03	.20**	.02	-	
LPxPA	.06*	.06*	−.04	.02	.02	−.16**	-
Wave 6							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.68**	-					
LP	.33**	.31**	-				
NA	.38**	.29**	.18**	-			
PA	−.13**	.00	−.17**	−.37**	-		
LPxNA	.04	.02	−.01	.17**	.01	-	
LPxPA	09**	.08**	.03	.01	−.04	−.36**	-
Wave 7							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.67**	-					
LP	.17**	.20**	-				
NA	.40**	.31**	.11**	-			
PA	−.10**	.03	−.14**	−.25**	-		
LPxNA	.00	−.05*	−.04	.12**	−.01	-	
LPxPA	.06**	.09**	.00	−.01	.07**	−.25**	-
Wave 8							
	NU	PU	LP	NA	PA	LPxNA	LPxPA
NU	-						
PU	.67**	-					
LP	.08**	.17**	-				

Wave 1							
	NU	**PU**	**LP**	**NA**	**PA**	**LPxNA**	**LPxPA**
NA	.44**	.35**	.12**	-			
PA	−.08**	.04	−.15**	−.30**	-		
LPxNA	−.06*	−.02	.01	.12**	−.02	-	
LPxPA	.06*	.05*	.00	−.02	.14**	−.27**	-

Note.

*=$p < .05$,

**= $p < .01$. Shaded correlations are those between urgency traits and corresponding interactions.

Table 3.

*Summary of Hierarchical Regression for LPxNA predicting Negative Urgency (*N=*1897)*

Wave 1						
	Step 1		**Step 2**		**Step 3**	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.01	.00	−.01	.24**	−.01	.001
Lack of Planning	--		.31**		.32**	
Negative Affect	--		.33**		.22**	
LPxNA	--		--		−.02	
Wave 2						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.00	.01	.19**	.01	.003
Lack of Planning	--		.30**		.30**	
Negative Affect	--		.28**		.28**	
LPxNA	--		--		−.05	
Wave 3						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.00	.00	.00	.19**	.00	.008**
Lack of Planning	--		.29**		.29**	
Negative Affect	--		.29**		.30**	
LPxNA	--		--		−.09**	
Wave 4						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.02	.00	−.01	.226**	−.01	.003
Lack of Planning	--		.30**		.30**	
Negative Affect	--		.33**		.33**	
LPxNA	--		--		−.05	
Wave 5						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.00	.01	.196**	.01	.014**
Lack of Planning	--		.24**		.24**	
Negative Affect	--		.33**		.36**	
LPxNA	--		--		−.12**	

Wave 1						
	Step 1		**Step 2**		**Step 3**	
Wave 6						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.01	.00	.01	.218**	.01	.00
Lack of Planning	--		.27**		.27**	
Negative Affect	--		.34**		.34**	
LPxNA	--		--		−.02	
Wave 7						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.00	.00	−.01	.18**	−.01	.002
Lack of Planning	--		.13**		.13**	
Negative Affect	--		.38**		.40**	
LPxNA	--		--		−.04	
Wave 8						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.00	.00	−.01	.208**	−.01	.01**
Lack of Planning	--		.03		.03	
Negative Affect	--		.44**		.46**	
LPxNA	--		--		−.11**	

Note.

* = $p < .01$,

** = $p < .001$.

Table 4.

*Summary of Hierarchical Regression for LPxPA predicting Positive Urgency (*N=*1897*)

Wave 1						
	Step 1		**Step 2**		**Step 3**	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.02	.00	.02	.10**	.02	.01*
Lack of Planning	--		.33**		.33**	
Positive Affect	--		.07*		.06*	
LPxPA	--		--		.07*	
Wave 2						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.02	.00	.03	.10**	.03	.02**
Lack of Planning	--		.32**		.33**	
Positive Affect	--		.09**		.07*	
LPxPA	--		--		.12**	
Wave 3						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.02	.00	-.02	.10**	-.01	.01**
Lack of Planning	--		.33**		.33**	
Positive Affect	--		.13**		.10**	
LPxPA	--		--		.10**	
Wave 4						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.03	.001	-.03	.10**	-.03	.01**
Lack of Planning	--		32**		32**	
Positive Affect	--		.02		.00	
LPxPA	--		--		.12**	
Wave 5						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.02	.00	.01	09**	.02	.01*
Lack of Planning	--		.30**		.30**	
Positive Affect	--		.05		.05	
LPxPA	--		--		.07*	

Wave 1						
	Step 1		**Step 2**		**Step 3**	
Wave 6						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.02	.00	-.01	.10**	-.01	.01*
Lack of Planning	--		.32**		.32**	
Positive Affect	--		.05		.06	
LPxPA	--		--		.08*	
Wave 7						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.01	.00	-.01	04**	-.10	.01**
Lack of Planning	--		.21**		.21**	
Positive Affect	--		.06*		.05	
LPxPA	--		--		.08**	
Wave 8						
	Step 1		Step 2		Step 3	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.01	.00	-.02	.03**	-.02	.00
Lack of Planning	--		.18**		.18**	
Positive Affect	--		.07*		.06*	
LPxPA	--		--		.05	

Note.

* = $p < .01$,

** = $p < .001$.

Table 5.

*Summary of Hierarchical Regression for Negative Urgency versus LPxNA predicting drinking (*N*=1897)*

Wave 1 → Wave 2								
	Step 1		**Step 2**		**Step 3**		**Step 4**	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.19**	.01	.01**	.01	.00	.01	.01**
Drinking	.44**		.42**		.42**		.41**	
Lack of Planning	--		.11**		.11**		.08**	
Negative Affect	--		−.04		−.04		−.07*	
LPxNA	--		--		−.03		−.02	
Negative Urgency	--		--		--		.10**	
Wave 2 → Wave 3								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.05	.18**	.05	.01**	.05	.00	.05	.01**
Drinking	.42**		.40**		.40**		.38**	
Lack of Planning	--		.08**		.08**		.05	
Negative Affect	--		.04		.04		.01	
LPxNA	--		--		.03		.03	
Negative Urgency	--		--		--		.12**	
Wave 3 → Wave 4								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.01	.23**	−.01	.01**	−.01	.00	−.01	.00
Drinking	.48**		.46**		.46**		.45**	
Lack of Planning	--		.10**		.10**		.09**	
Negative Affect	--		.03		.02		.01	
LPxNA	--		--		.01		.01	
Negative Urgency	--		--		--		.04	
Wave 4 → Wave 5								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.28**	.01	.01**	.01	.00	.01	.01**
Drinking	.53**		.51**		.51**		.50**	
Lack of Planning	--		.10**		.10**		.06*	
Negative Affect	--		.02		.02		−.02	
LPxNA	--		--		.03		.03	

Wave 1 → Wave 2								
	Step 1		**Step 2**		**Step 3**		**Step 4**	
Negative Urgency	--		--		--		.11**	
Wave 5 → Wave 6								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.02	.28**	−.02	.01**	−.02	.00	−.02	.01**
Drinking	.53**		.50**		.50**		.48**	
Lack of Planning	--		.08**		.08**		.05*	
Negative Affect	--		.06*		.07*		.03	
LPxNA	--		--		−.04		−.03	
Negative Urgency	--		--		--		.13**	
Wave 6 → Wave 7								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.30**	.01	.01**	.01	.00	.02	.01**
Drinking	.55**		.52**		.52**		.51**	
Lack of Planning	--		.12**		.12**		.10**	
Negative Affect	--		−.03		−.03		−.06*	
LPxNA	--		--		.00		.01	
Negative Urgency	--		--		--		.08**	
Wave 7 → Wave 8								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	−.02	.19**	−.02	.02**	−.02	.00	−.02	.01**
Drinking	.44**		.41**		.41**		.38**	
Lack of Planning	--		.15**		.15**		14**	
Negative Affect	--		.02		.02		−.02	
LPxNA	--		--		−.01		−.01	
Negative Urgency	--		--		--		.12**	

Note.

* = $p < .01$,

** = $p < .001$.

Table 6.

*Summary of Hierarchical Regression for Positive Urgency versus LPxPA predicting drinking (*N*=1897)*

Wave 1 → Wave 2								
	Step 1		**Step 2**		**Step 3**		**Step 4**	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.19**	.01	.01**	.01	.00	.01	.00
Drinking	.44**		.42**		.42**		.41**	
Lack of Planning	--		.10**		.10		.08**	
Positive Affect	--		-.04		-.04		-.04	
LPxPA	--		--		.00		.`00	
Positive Urgency	--		--		--		.05	
Wave 2 → Wave 3								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.05	.18**	.05	.01**	.05	.00	.04	.01**
Drinking	.42**		.40**		.40**		.39**	
Lack of Planning	--		.10**		.10**		.06*	
Positive Affect	--		.04		.03		.02	
LPxPA	--		--		.02		.01	
Positive Urgency	--		--		--		.11**	
Wave 3 → Wave 4								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.01	.29**	-.01	.01**	-.01	.00	-.01	.00
Drinking	.54**		.52**		.52**		.51**	
Lack of Planning	--		.08**		.08**		.07**	
Positive Affect	--		-.07**		-.06*		-.06*	
LPxPA	--		--		-.02		-.02	
Positive Urgency	--		--		--		.02	
Wave 4 → Wave 5								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.36**	.01	.01**	.01	.000	.02	.01*
Drinking	.60**		.59**		.59**		.58**	
Lack of Planning	--		.10**		.10**		.08**	
Positive Affect	--		.04		.04		.04	
LPxPA	--		--		.00		-.01	
Positive Urgency	--		--		--		.06*	

Wave 1 → Wave 2								
	Step 1		**Step 2**		**Step 3**		**Step 4**	
Wave 5 → Wave 6								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.02	.30**	-.03	.01*	-.03	.00	-.03	.01**
Drinking	.55**		.54**		.54**		.52**	
Lack of Planning	--		.06*		.06*		.04	
Positive Affect	--		.03		.03		.02	
LPxPA	--		--		-.01		-.01	
Positive Urgency	--		--		--		.10**	
Wave 6 → Wave 7								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	.01	.33**	.01	.02**	.01	.00	01	.01*
Drinking	.58**		.56**		.56**		.55**	
Lack of Planning	--		.14**		.14**		.12**	
Positive Affect	--		.10**		.10**		.10**	
LPxPA	--		--		.01		.01	
Positive Urgency	--		--		--		.06*	
Wave 7 → Wave 8								
	Step 1		Step 2		Step 3		Step 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Gender	-.01	.27**	-.01	.02**	-.01	.00	-.01	.002
Drinking	.52**		-.49**		.49**		.48**	
Lack of Planning	–		.14**		.14**		.13**	
Positive Affect	--		.01		.01		.01	
LPxPA	--		--		-.03		-.04	
Positive Urgency	--		--		--		.05	

Note.

* = $p < .01$,

** = $p < .001$.