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A comparison of two models of Urgency: Urgency predicts both rash action and depression in youth

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Abstract

The aim of this study was to test two competing theories concerning the trait of urgency: (1) urgency reflects the tendency to act rashly/impulsively when emotional; or (2) urgency reflects a general reflexive responsivity to emotions that can lead either to rash action or ill-advised inaction, and thus to either impulsive behavior or depression. Following prior findings that 5th grade urgency predicted 6th grade impulsive behavior, we tested whether urgency also predicted 6th grade depression ($n = 1,906$). After controlling for sex, early pubertal onset, 5th grade depression, 5th grade engagement in addictive behaviors, negative affect, positive affect, and other impulsivity-related traits, 5th grade urgency level did predict higher levels of depression at the end of 6th grade. This finding is consistent with the view that urgency can lead either to rash action or ill-advised inaction. Urgency may be of transdiagnostic importance, contributing both to internalizing and externalizing dysfunction.

In this paper, we report on a longitudinal test comparing two competing models for understanding the function of the trait of urgency, and thus more broadly for understanding reflexive or impulsive responses to intense emotion. We have argued that urgency is a personality disposition reflecting the tendency to act in rash, ill-advised ways when highly emotional (Cyders & Smith, 2007, 2008). There are two facets to this disposition: negative urgency reflects the tendency to act rashly when distressed, and positive urgency reflects the tendency to act rashly when in an unusually positive mood. Items on the urgency scales came from measures designed and understood to reflect a disposition toward impulsivity (Cyders, Smith, Spillane, Fischer, Annus, & Peterson, 2007; Whiteside & Lynam, 2001), and accordingly, urgency has been shown to be a particularly important prospective predictor of rash or impulsive action, including binge eating, problem drinking, pathological gambling, and risky sex (Anestis, Selby, & Joiner, 2007; Claes, Vandereycken, & Vertommen, 2005; Cyders, Flory, Rainer, & Smith, 2009; Cyders & Smith, 2008; Fischer, Peterson, & McCarthy, in press; Pearson, Combs, Zapolski, & Smith, 2012; Settles, Cyders, & Smith, 2010; Zapolski, Cyders, & Smith, 2009).¹ Based on these findings, we have argued that urgency is an important personality contributor transdiagnostically, in particular

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¹There are other personality models of impulsivity that merit consideration by researchers (Buss & Plomin, 1975; Dickman, 1990; Evenden, 1999; Gray & McNaughton, 2000; Patton, Stanford, & Barratt, 1995; Wills, Pokhrel, Morehouse, & Fenster, 2011); we focused on the Whiteside and Lynam (2001), Cyders and Smith (2007) model because we were testing a theory of urgency, a trait that is part of that model.

for the spectrum of externalizing disorders (Settles, Fischer, Cyders, Combs, Gunn, & Smith, 2012).

Perhaps it is the case that individual differences in urgency represent one important source of individual differences in self-regulation. There is considerable evidence that individual differences in self-regulation early in life predict adjustment over many years, including the capacity to cope with frustration and stress, criminal behavior, social competence, and academic success (Henry, Caspi, Moffitt, Harrington, & Silva, 1999; Metcalfe & Mischel, 1999; Mischel, Shoda, & Peake, 1988; Mischel, Shoda, & Rodriguez, 1989). Metcalfe and Mischel (1999) identify developmental factors, stress, chronic environmental factors, pharmacological factors, and dispositional factors as influences on self-regulation; urgency may reflect one important dispositional factor.

Carver and colleagues recently offered a broader conceptualization of the role of urgency, identifying it as part of a larger overall construct: reflexive responsivity to emotion (RRE; Carver, Johnson, & Joormann, 2008). In their model, individuals may respond reflexively to emotions either with rash action (which can lead to externalizing dysfunction) or with ill-advised inaction (which can lead to internalizing dysfunction). Similar to our theory, rash action such as heavy drinking can be a response to intense emotion that provides either the negative reinforcement of relief by providing a distraction from the source of the distress or positive reinforcement by enhancing a celebratory mood (Cyders & Smith, 2008). However, in contrast to our theory, in Carver et al.'s (2008) model, ill-advised inaction can also be a response to intense emotion, with the similar goal of relief from distress. For example, choosing not to ask a date to the prom or failing to ask one's boss for a raise or promotion, can provide immediate relief from distress, even though these forms of inaction work against one's ongoing interests. Failure to act to pursue one's interests or to obtain potential reinforcement is associated with depressive symptomatology (Jacobson, Martell, & Dimidjian, 2001; Lewinsohn, 1975; Skinner, 1953). Thus, counter to our theory, Carver et al. (2008) identify urgency as a marker of RRE, and therefore as predictive of both rash action and ill-advised inaction. From this alternative conceptualization, urgency should predict dysfunction reflecting rash action (such as heavy drinking or binge eating) as well as dysfunction reflecting ill-advised inaction (such as depressive symptomatology), and thus be of even broader transdiagnostic importance.

Carver et al. (2008) offer evidence from the neuroscience literature to support their framework, in particular noting that both impulsive behavior and depressive symptomatology are related to reduced levels of serotonin in the same brain system. Specifically, there are neuronal connections between the amygdala, which is subcortical, and parts of the prefrontal cortex (PFC), notably the orbitofrontal cortex (OFC) and its medial sector (the ventromedial prefrontal cortex [VMPFC]; Bechara, 2005; Lewis & Todd, 2007). The amygdala appears to provide information about the emotional significance of sensory input, thereby influencing activity in the OFC and VMPFC. Thus, the emotional significance of events influences subsequent cortical activity. In turn, the OFC and VMPFC appear to exhibit a regulating effect on the amygdala and the brain stem (Bechara, 2005; Ghashghaei & Barbas, 2002; Lewis & Todd, 2007). The OFC can interrupt the direct connection between emotion and response: OFC activity overrides emotional responses, apparently by providing information

and a bias toward long-term, goal directed behavior (Lewis & Todd, 2007). The result is the capacity to interrupt responses to immediate needs in light of long-term interests and goals. With reduced serotonin in this system, the PFC provides less interruption of emotion-driven responses, thus increasing the likelihood of either impulsive action or ill-advised inaction (i.e. increasing the likelihood of RRE).

From the Carver et al. (2008) perspective, what determines whether RRE is expressed as rash action or ill-advised inaction is determined by two factors: individual differences in reward and punishment sensitivity. That is, a high RRE, high reward sensitive individual will engage in rash actions and risky behaviors; whereas a high RRE, high punishment sensitive individual will tend to engage in ill-advised inaction, and thus be at increased risk for internalizing dysfunction, such as depression.

The aim of this investigation was to conduct a comparative test of our model of urgency versus the Carver model of urgency, using a prospective design in a developmental context. Previously, we have shown that urgency levels in 5th grade, the last year of elementary school, predict the subsequent onset of, and increases in, the addictive behaviors of alcohol consumption, binge eating, and smoking across the first year of middle school (6th grade: Guller et al., 2012; Pearson et al., 2012; Settles & Smith, 2011). Those findings are consistent with both models. In the study described here, we tested whether 5th grade urgency predicted depressive symptomology across the first year of middle school. A positive finding would support Carver et al.'s (2008) model over our model; a negative result in this amply powered study ($n = 1906$) would favor our model, although less definitively so. This study is the first longitudinal comparison of predictions from the two models.

For several reasons, we chose to conduct the test during this developmental period. First, even moderate levels of depressive symptomology in early adolescence can have long-term effects on children into adulthood (Nolen-Hoeksema & Girgus, 1994), including increased levels of depression (Pine, Cohen, Cohen, & Brook, 1999), reduced self-esteem and lowered adaptive functioning (Aronen & Soininen, 2000), increased aggression (Aronen & Soininen, 2000), and personality disordered functioning (Kasen, Cohen, Skodol, Johnson, Smailes, & Brook, 2001). If it is possible to predict early middle school depressive symptom level from urgency measured in elementary school, then clinical risk assessment science would be advanced as well as RRE theory being supported.

Second, and related to this point, the transition into middle school represents an important part of the contextual change associated with the move from childhood to adolescence. The transition typically includes exposure to larger, more impersonal school contexts (Barber & Olsen, 2004; Eccles, Wigfield, Harold, & Blumenfeld, 1993), increases in personal autonomy (Eccles & Midgley, 1990), and involvement in a setting in which the needs and drives associated with physically mature bodies are manifest, because most middle schoolers have experienced pubertal onset. Because this transition has been described as a potential turning point in development (Graber & Brooks-Gunn, 1996; Rutter, 1994), prediction of depressive symptomology following this transition from personality measured prior to it would add to researchers' understanding of risk for maladaptive transition experiences.

Third, prospective relationships between urgency and depression among adults would perhaps be more likely to reflect “downstream” influences of other factors, such as existing psychopathology or lifestyle choices that could influence both the trait and the disorder. By studying children this young, we reduce the likelihood that observed effects are artifacts of such other, unmeasured factors.

Support for the Carver et al. (2008) framework would suggest that responding reflexively to intense emotion, as indexed by urgency, increases risk for both externalizing and internalizing dysfunction, and would thus highlight the value of research on factors that influence the relative likelihood of the two kinds of dysfunction among individuals high in RRE. A failure to support Carver et al. (2008) would suggest the possibility that urgency is important primarily for externalizing dysfunction, and other, different traits contribute more heavily to internalizing dysfunction, consistent with Settles et al. (2012).

Method

Participants

Participants at wave 1 (baseline) of the study ($n = 1906$) consisted of 5th grade public school students from urban, rural, and suburban backgrounds. The sample was split roughly equally between boys (50.1%) and girls. The ethnic breakdown was 61.6% European American, 17.0% African American, 6.9% Hispanic/Latino, 3% Asian American, and 11.5% of students reporting other ethnic backgrounds. The majority of the fifth graders at baseline were 11 years old (66.8%) and 99.8% were aged 10–12. In a previous paper, we tested a risk model for early onset eating disorder symptomatology in this sample (Pearson et al., 2012).

Measures

Demographic Information was assessed using a brief questionnaire. Items on the measure included sex, age, ethnicity, and other demographic factors.

The Pubertal Development Scale (PDS; Petersen, Crockett, Richards, & Boxer, 1988) was used to assess pubertal onset. This scale consists of five questions for boys (“do you have facial hair yet?”) and five questions for girls (“have your breasts started to develop (grow) yet?”), with all questions but the one asking about the onset of menstrual cycle for girls scored on a four point scale. Evidence for reliability and validity are strong (Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987; Coleman & Coleman, 2002). We used the common dichotomous classification of the PDS (Culbert, Burt, McGue, Iacono, & Klump, 2009), in which mean scores above 2.5 are understood to indicate pubertal onset. We defined pubertal onset by 5th grade as early pubertal onset: this definition included 22.1% of boys and 27.7% of girls.

The UPPS-P-Child Version (Zapolski, Stairs, Settles, Combs, & Smith, 2010) was used to measure the three trait domains of urgency, low conscientiousness, and sensation seeking, as well as the facets of each domain. Item responses are on a four-point Likert-type scale, ranging from “not at all like me” to “very much like me.” The UPPS-P Child Version was recently found to have good internal consistency, high reliability across multiple raters, and

good convergent and discriminant validity as evidenced by multitrait multimethod analysis, when used to measure impulsivity-related traits in children as young as 10 years old (Zapolski et al., 2010). Preliminary analyses of the current sample indicated that the traits within a common domain are very highly correlated (positive and negative urgency: $r = .63$; lack of planning and lack of perseverance: $r = .44$, $p < .001$ for both). Furthermore, predictive relationships did not differ between facets within a domain. Therefore, we used the three domain scores, rather than individual facet scores, as predictors. Internal consistency reliability estimates for the three domains in the current sample were .91 for urgency, .77 for low conscientiousness, and .79 for sensation seeking.

Center for Epidemiological Studies-Depression Scale (CES-D: Radloff, 1977) was used to measure individual differences in depressive symptomology, as has previously been used in this age group (Clarke et al., 2005). The scale has proven reliable (internal consistency estimates ranging from .85 to .90) and valid in numerous studies; it is frequently used with children, adolescents, and adults (Clarke et al., 2005; Radloff, 1977, 1991; Roberts, Lewinsohn, & Seeley, 1991). We used CES-D scores as interval scale indicators of depressive symptomology ($\alpha = .85$, initial assessment in current sample).

Positive and Negative Affective Scale- Child Version (PANAS-C; Laurent et al., 1999) was used to measure the dimensions of positive affectivity and negative affectivity in children. It was developed and validated on children in grades 4–8, based on the adult PANAS (Watson, Clark, & Tellegen, 1988). Items were adapted from asking how one feels over “the past few weeks” to how one “generally” feels. The scales were internally consistent in this study (initial assessment: negative affect $\alpha = .90$; positive affect $\alpha = .85$).

The Drinking Styles Questionnaire (Smith, McCarthy, & Goldman, 1995) was used to measure self-reported drinking. Youth were classified as positive for drinking if they reported ever having consumed at least one drink, where a drink was defined as follows: “... a ‘drink’ is 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.)” Frequency of drinking was measured at levels ranging from 1–4 times in one’s life to almost daily. This assessment method has proven stable over time and there is good evidence for its validity among early and late adolescents (Settles, Cyders, & Smith, 2010).

Smoking Behavior was measured using a single item of smoking frequency, ranging from 1–4 times in one’s life to almost daily. Youth were classified as smoking if they had consumed 1 or more cigarettes in their lives. Numerous brief measures of self-reported cigarette smoking have previously been used in prospective studies of adolescents (Chassin et al., 2000; Colder et al., 2001; Wills et al., 2001); many of which use a single item.

The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994), a self-report version of the Eating Disorders Examination semi-structured interview (Cooper & Fairburn, 1993), was used to assess binge eating. Using recommendations for childhood assessment (Carter, Stewart, & Fairburn, 2001), the EDE-Q questions were modified to define terms, use age-appropriate wording, and to assess binge eating over the past 14 days, rather than the past 28 days (the latter is done with adults). Binge status was defined by an

affirmative answer on each of two separate EDE-Q questions, one asking about the frequency of having eaten a large amount of food while feeling out of control over the past 2 weeks, and the other defining binge eating and asking if the participant had ever engaged in the behavior. The frequency of binge eating ranged from 1–2 days in the past 14 days to every day in the past 14 days.

Procedure

Questionnaire administration procedures—The questionnaires were administered in 23 public elementary schools during school hours for the first wave and in 19 public middle schools during school hours for the second wave. A passive consent procedure was used: Each family was sent a letter through the U.S. Mail to introduce the study and families were asked to return an enclosed, stamped letter or call a phone number if they did not want their child to participate. Out of 1988 fifth grade students in the participating schools, 95.8% (1906) of the students participated in the study. Due to one of the following reasons, a total of 82 students did not participate: Families declined to participate, students declined assent, or a variety of other reasons, such as language disabilities that precluded completing the questionnaires. Questionnaires were administered in school cafeterias or classrooms. The first data collection took place in the last month of the students' fifth grade year in their elementary schools. The second data collection took place in the last month of their sixth grade year.

Students were assured that their responses on the questionnaires would be kept confidential and that no one outside of the research team would see them. The research team introduced a federal certificate of confidentiality for the project and emphasized that they were legally bound to keep all responses confidential. After assent forms were signed, the researchers passed out the packets of questionnaires. Except for those who moved out of district (these participants were contacted, asked to complete the forms by mail and were paid \$30 for doing so), there was no compensation for participation. Total questionnaire administration took 60 minutes or less. This procedure was approved by the University's IRB and by the participating school systems.

Results

Participation Attrition

We first considered whether the sample was likely to be biased due to attrition from the study. Retention from wave 1 to wave 2 was high: 94%. In addition, individuals who participated in both waves of the study did not differ from those who participated in only one wave on any demographic, criterion, or trait variable. Therefore, it was concluded that data were missing at random. Under that assumption, we imputed values for missing data 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, 2006). The study sample was characterized by relatively low attrition and missing data appeared to be missing at random, thus permitting imputation of data for those missing values.

Tests of School-Specific Effects

We next considered the possibility that endorsement of study variables was, in part, a function of the school attended by the participants. To test for this possibility, we calculated intraclass correlation coefficients for each study variable, using elementary school membership, $n = 23$, as the nesting variable. We found no significant effects on any variable based on school membership. Intraclass correlations ranged from 0.03 to 0.00.

Sample Characteristics

We first investigated the distributions of each variable. CES-D scores were positively skewed to a moderate degree (skew values ranged from 1.52 to 1.64) and moderately kurtotic (kurtosis values ranged from 2.72 to 3.47). For that reason, we conducted all analyses on both the original CES-D scores and on square root transformed CES-D scores (transformed scores were appreciably closer to normally distributed: skew values for the transformed scores were 1.23 or below, and kurtosis values ranged from 1.33 to 1.77). There was neither significant skew nor kurtosis for other study variables.

In Table 1, we report the frequencies of each addictive behavior, mean levels of depressive symptomatology, and the frequency of pubertal onset at both waves of data collection. As the table shows, participants reported increases in drinking and smoking, but a drop in binge eating, over the one-year period. This pattern is consistent with prior research (Donovan, 2007; Tanofsky-Kraff et al., 2011); the drop in binge eating appears to reflect improved control over eating behavior during this period of time (Combs, Pearson, Zapolski, & Smith, 2012). Mean depression scores did not change over the one year period.

Bivariate Relationships among Sex, Pubertal Status, Impulsivity-Related Traits, Addictive Behavior Involvement, and Depressive Symptomatology

Table 2 provides estimates of the uncorrected, bivariate relationships among study variables. Because of the large sample size, we used $p < .001$ as the cutoff for statistical significance. As depicted in the table, the three impulsivity-related trait domains were only modestly correlated, sharing between 2% and 10% of their variance. This pattern of correlations supports the distinction between urgency, an emotion-based trait, and other traits thought to underlie impulsive behavior. Time 1 urgency, shown previously to correlate with the addictive behavior measures in this sample, also correlated with depressive symptom level at both time points. All three addictive behaviors (drinking, smoking, binge eating) were associated with depression at baseline. In addition, urgency consistently correlated more highly than the other impulsivity-related traits with depressive symptomatology, negative affectivity, and addictive behavior involvement.

Test of Urgency Predicting Depression Across the Transition into Middle School

The central test of this study was whether urgency predicted changes in depressive symptomatology over the 12 months reflecting the transition into middle school. To conduct a rigorous test of this possibility, we tested for the presence of successful prediction above and beyond the influence of several other possible predictors. We therefore conducted a set of hierarchical multiple regression analyses. These analyses involved prediction across a 12

month time lag, from the spring of 5th grade (the last year of elementary school) to the spring of 6th grade (the end of the first year of middle school). The criterion variable was 6th grade CES-D depression scores.

At step one, we entered sex and early pubertal onset. Both variables predicted subsequent depression scores (female sex and pubertal onset were associated with greater depressive symptomatology); together they explained 2% of the variance in the criterion. At step two, we entered time 1 CES-D scores, positive affectivity, and negative affectivity: all factors likely to predict subsequent CES-D scores. At this step, time 1 CES-D depression score was the only predictor with incremental validity, and it explained an additional 16% of the variance in time 2 depression scores. At step three, we entered drinking frequency, binge eating frequency, and smoking frequency. Inclusion of these predictors provides some control for the possibility that subsequent depression levels were influenced by prior addictive behavior involvement, perhaps reflecting a process in which urgency led to addictive behaviors, which in turn led to increased depression levels. Of the three predictors, only time 1 drinking predicted beyond the prior predictors, and its effect was not large (standardized $b = .07$). At step four, we entered sensation seeking and low conscientiousness, two other impulsivity-related trait dimensions. Neither trait added to the prediction of time 2 depression scores. At step five, we entered urgency. We thus tested whether time 1 urgency predicted subsequent depressive symptomatology above and beyond numerous other possible predictors. It did ($b = .15, p < .001$), explaining an additional 1% of the variance in time 2 depression scores beyond the other predictors. Together, the predictors explained 20% of the variance in 6th grade CES-D scores.

We repeated the analysis with square root transformed depressive symptom scores. Results were the same: each significant predictor remained significant, no additional predictors became statistically significant, and the magnitude of the beta weights changed very little (step 5 urgency $b = .16, p < .001$). Urgency did predict depressive symptomatology prospectively, and did so beyond prediction from prior depressive symptoms and other predictors.

Discussion

The central finding of the current study is that, consistent with the Carver et al. (2008) conceptualization of RRE and inconsistent with our narrower understanding of urgency as a disposition to rash action, urgency measured in elementary school predicted higher levels of depressive symptomatology twelve months later (i.e., across the transition into middle school). This successful prediction, and its support for the Carver et al. (2008) framework, is noteworthy for several reasons. First, urgency predicted subsequent depression level above and beyond several other, important predictors, including biological sex, pubertal status, prior levels of depressive symptomatology, and negative and positive affectivity. Second, the prediction was in young children (most were age 11 at wave 1), vastly reducing the possibility that the urgency – depression relationship reflects scars of ongoing psychopathology and life disruption. Third, the transition into middle school is a potential turning point in development for many youth, so prediction of depressive symptom endorsement by urgency across that transition may increase understanding of risk for a

maladaptive transition and, potentially, progression along a more negative developmental trajectory.

A fourth reason that the findings in support of the Carver et al. (2008) model are striking concerns the content of the urgency items. Examples include “When I feel bad, I often do things I later regret in order to make myself feel better now,” “When I am upset I often act without thinking,” “I tend to act without thinking when I am very, very happy,” and “When I am really happy, I tend to get out of control.” The items consistently refer to tendencies toward action and include both very negative and very positive moods. There appears to be no measurement bias toward overlap with depressive symptomatology, nor is there a measurement bias toward overlap with inaction. In addition, urgency predicted depressive symptoms after controlling for involvement in addictive behaviors, thus reducing the likelihood that urgency’s predictive influence on depression was actually an artifact of its relationship with addictive behavior involvement (such as might have been the case if depressive symptom endorsement stemmed from negative consequences of addictive behavior involvement). Given that items with this content predicted depressive symptomatology over time and with stringent controls suggests that the intended construct, urgency, can be viewed as a marker of RRE. Because of the item focus on action, we do not view urgency as isomorphic with RRE; in their work, Carver and colleagues supplement urgency with measures of emotion-based inaction (Carver, Johnson, Joormann, Kim, & Nam, 2011) to get a broader array of indicators of RRE. Our use of only urgency to predict depression makes the current test particularly stringent.

Thus, the findings provide clear support for a conceptualization of urgency as a marker of a tendency to respond reflexively to emotion, whether with rash action or ill-advised inaction, and thus of importance in a broad, transdiagnostic way. Adults sometimes engage in rash actions, such as heavy alcohol consumption, risky sexual behavior, problem gambling, binge eating, and other behaviors, with the apparent goal of relief from, or distraction from, subjective distress (Cyders & Smith, 2008; Fischer, Smith, & Cyders, 2008; Settles et al., 2010; Smyth, Heron, Sliwinski, et al., 2007; Swendson, Tennen, Carney, Affleck, Willard, & Hromi, 2000; Zapolski et al., 2009). Similarly, inaction can serve the same purpose, even when action would be beneficial (Carver et al., 2008, 2011). The findings of the current study and of Guller et al. (2012), who showed that urgency predicted subsequent addictive behavior, suggest similar processes appear to operate in children making the transition from elementary school to middle school. Thus, in both children and adults, individual differences in the trait of urgency should perhaps be understood to reflect this general disposition toward RRE, and hence to increase risk for both the internalizing and externalizing spectra of behaviors, rather than simply a disposition toward impulsive action.

This support for the Carver et al. (2008) framework is consistent with cognitive neuroscience literature that identifies the same brain process as underlying both externalizing dysfunction and depression. As noted above, low levels of serotonin in a functional brain system relating the orbitofrontal and ventromedial prefrontal cortex to the amygdala and striatum are implicated in both (Carver et al., 2008; Cyders & Smith, 2008). Davidson (2003) makes a similar observation. From his perspective, low levels of serotonin in this brain system are associated with deficits in affect-guided planning, which is the

capacity to stay affectively connected to one's long-term goals, and choose behaviors that further those goals, even when one is experiencing intense emotion in the moment. There thus appears to be convergence between the Carver et al. (2008) and the Davidson (2003) perspectives: high levels of RRE appear analogous to low levels of affect-guided planning; both are associated with specific functional deficits in the same identified brain system. The findings of this study indicate that urgency can be viewed as a marker of high RRE, and thus presumably of low affect-guided planning. Perhaps urgency is the tendency to respond to intense emotion with actions or with inactions that reduce distress but that are ill-advised, in that they are not chosen with an eye toward one's ongoing interests.

If the tendency to respond reflexively to emotion, partly indexed by urgency, contributes to both the externalizing and internalizing spectra of dysfunction, a crucial next challenge in this domain of clinical science is to identify what factors influence the tendency, by some, to engage primarily in externalizing behaviors while others engage primarily in internalizing behaviors. One possibility is that, separate from individual differences in the tendency to respond reflexively to emotion, there are individual differences in incentive or reward sensitivity. If so, then a reflexive response to emotion among individuals high in incentive sensitivity could result in ill-considered incentive-pursuit behaviors, i.e., impulsive acts. In contrast, a reflexive response to emotion among individuals very low in incentive sensitivity, or perhaps high in punishment sensitivity, could result in more extreme levels of inaction, perhaps leading to significant reductions in reward experiences and depression. Carver et al. (2008) suggest this possibility and provide it with a brief treatment in their theory paper.

A related possibility involves the concepts of approach temperament and avoidance temperament (Elliot & Thrash, 2002). Approach temperament is understood to refer to a fundamental sensitivity to positive or desirable stimuli, including perceptual vigilance for, emotional reactivity to, and behavioral predisposition toward rewarding stimuli (Elliot & Thrash, 2002). Avoidance temperament is understood to refer to a fundamental sensitivity to, or concern about, negative or undesirable stimuli, similarly accompanied by perceptual vigilance for, emotional reactivity to, and behavioral disposition away from such stimuli (Elliot & Thrash, 2002). Interestingly, the two temperaments appear to be unrelated: in a series of six studies, the median correlation between measures of the two was $r = .02$. Perhaps, among individuals high in RRE, those high in approach temperament are prone to rash action and those high in avoidance temperament are prone to ill-advised inaction. If so, what is the case for individuals high in both temperaments? Perhaps such individuals have a tendency toward rash action accompanied by distress over their actions. A related question is whether there are functional brain systems that underlie these dispositions, and if so, how those systems interact with the brain system thought to underlie RRE.

At present, these and other possibilities exist for understanding differential dispositions toward rash action and ill-advised inaction among individuals disposed to respond reflexively to intense emotion. An important next step will be to evaluate such possibilities empirically. Sound measurement of the key constructs will, of course, be essential. Longitudinal investigations of the interplay of RRE and approach/avoidance or incentive

sensitivity/punishment sensitivity in the prediction of dysfunction characterized by impulsive action or inaction may well prove useful.

The two other impulsivity-related personality domains we studied, low conscientiousness and sensation seeking, do not involve emotion content and did not predict depressive symptomology in this young sample. Tendencies to act without forethought, to fail to persevere on tasks, or to seek novel, thrilling stimulation do not appear to increase risk for depressive symptomology, at least in children. In contrast, the tendency to act in ill-advised ways when emotional did increase risk for depressive symptomology in the current sample. Urgency appears to operate differently from low conscientiousness and sensation seeking.

These findings should be viewed in the context of the limitations to the study. Although the narrow focus of the study on the transition from elementary school to middle school is a strength of the research in that it allowed us to focus on a key developmental period in adolescence, it is also a weakness. The small period of time prevented us from collecting information about personality and depression later in adolescence; therefore, we do not know whether the prospective relationship between urgency and depression persists across time. In addition, although there is good evidence for the reliability and validity of the self-report questionnaires we used, their use limited our ability to clarify items and content as would have been possible if an interview-style assessment had been used. Studying broad personality variables as predictors of depression in our analyses provided no information about the mechanism by which urgency may lead to increases in depression. The theory we tested holds that urgency is a marker of ill-advised inaction, but we did not study ill-advised inaction directly. Our use of depressive symptomology as a marker or consequence of ill-advised inaction, though reasonable, does leave open the possibility that urgency predicted depression through some mechanism other than emotion-driven inaction. Lastly, although the model was prospective in design and included tight controls, our predictive findings are not a rigorous test of causality. Despite these limitations, the findings of this study do support the possibility that the trait of urgency is a marker of the tendency to respond in reflexive, ill-considered ways to intense emotion, resulting either in ill-advised action or ill-advised inaction, thereby increasing risk for both the externalizing and internalizing spectra of problem behaviors.

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Table 1

Descriptive Statistics for Drinking, Smoking, Binge Eating, and Pubertal Status by Wave

	Baseline n (%)	12-month Follow-up n (%)
Drink	234 (12.3%)	280 (14.7%)
Smoke	106 (5.6%)	158 (8.3%)
Binge	281 (14.7%)	171 (9.0%)
Pubertal Onset	473 (24.8%)	756 (39.7%)
CES-D (mean, SD)	14.3 (8.6)	13.4 (8.6)

Table 2

Correlation Matrix of Study Variables

	Pb1	Dp1	Dp2	NA1	PA1	UI	LC1	SS1	Dr1	Dr2	Sm1	Sm2	Bg1	Bg2
Sex1	.06	.09*	.10*	.10*	.04	-.02	-.08*	-.24*	-.05	-.05	-.02	-.01	-.01	-.01
Pb1	-	.14*	.11*	.04	-.01	.15*	.03	.09*	.14*	.09*	.15*	.12*	.07*	.08*
Dp1	-	.41*	.50*	-.14*	.43*	.13*	.12*	.11*	.13*	.10*	.13*	.10*	.27*	.18*
Dp2	-	-	.25*	-.09*	.28*	.08*	.08*	.01	.09*	.13*	.03	.07*	.14*	.19*
NA1	-	-	-	-.14*	.40*	.11*	.11*	-.01	.09*	-.01	.06	.05	.19*	.17*
PA1	-	-	-	-	-.07*	-.38*	-.38*	.20*	-.07*	-.09*	-.08*	-.05	-.05	-.02
UI	-	-	-	-	-	.24*	.24*	.32*	.22*	.19*	.22*	.20*	.23*	.16*
LC1	-	-	-	-	-	-	-	-.06*	.17*	.16*	.14*	.15*	.08*	.03
SS1	-	-	-	-	-	-	-	-	.14*	.17*	.04	.03	.10*	.05
Dr1	-	-	-	-	-	-	-	-	-	.44*	.55*	.30*	.10*	.08*
D2	-	-	-	-	-	-	-	-	-	-	.30*	.43*	.06*	.10*
Sm1	-	-	-	-	-	-	-	-	-	-	-	.46*	.08*	.10*
Sm2	-	-	-	-	-	-	-	-	-	-	-	-	.05	.04
Bg1	-	-	-	-	-	-	-	-	-	-	-	-	-	.23*

n=1906. Pb: pubertal onset; Dp: CES-D depression; NA: PANAS negative affect; PA: PANAS positive affect; U: urgency; LC: low conscientiousness; SS: sensation seeking; Dr: drinking frequency; Sm: smoking frequency; Bg: binge eating frequency; 1: baseline; 2: 12-month follow-up.

* $p < .001$