

Negative Affect in the Relationship between Internalizing Symptoms and Aggression:

The Role of Effortful Control

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Thesis submitted to the Faculty of Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
Master of Science
In Psychology

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March 1, 2013

Blacksburg, VA

Keywords: negative affect, effortful control, depression, anxiety, aggression

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ABSTRACT

Although comorbidity is common between internalizing symptoms such as anxiety and depression and externalizing symptoms such as aggression, the reason for this co-occurrence remains unclear. High negative affect is one factor that has been proposed to explain the connection between anxiety and depression, as well as between these internalizing symptoms and externalizing symptoms including aggression; however, on its own, it may not explain the common association between symptoms. Research on anxiety suggests that effortful control moderates the relationship between negative affect and anxiety. Low levels of effortful control have also been tied to symptoms of depression and aggression. It was hypothesized that effortful control would moderate the impact of negative affect in associations between internalizing symptoms (anxiety and depression) and aggression such that individuals who have both high levels of negative affect and low levels of effortful control will be more likely to experience both internalizing symptoms and aggression. It was further proposed that, among the functional subtypes of aggression, this relationship would hold only for reactive aggression, and not for proactive aggression. These predictions were tested via hierarchical regression analyses of self-report data from a large sample of undergraduate students. Findings suggest that effortful control moderates the relationship between negative affect and depression; however, it functions as an additive predictor for both anxiety and reactive aggression. These findings and their implications are discussed.

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Introduction

Across the lifespan, internalizing symptoms, such as depression and anxiety, and externalizing symptoms, such as aggression, co-occur at rates that are greater than chance, exacting a substantial burden on sufferers as well as the victims of aggressive acts. According to the National Comorbidity Survey Replication (Kessler, Chiu, Demler, & Walters, 2005), correlations between internalizing disorders and externalizing disorders (delinquent and aggressive behavior) in adults are as high as $r = 0.48$. This co-occurrence is evident earlier in life as well. For instance, Gjone and Stevenson (1997) described correlations between internalizing and externalizing symptoms of up to $r = 0.58$ in a non-clinical twin sample of children between ages 5-15. However, the reasons for these observed associations are not completely understood.

Much research investigating internalizing and externalizing symptoms separately has demonstrated that, among internalizing symptoms, depression and anxiety frequently co-occur across the lifespan (Angold & Costello, 1993; Angold et al., 1999; Kessler et al., 2005), as do externalizing symptoms (e.g., Collett, Ohan, & Myers, 2003; Connor et al., 2003), which include rule-breaking behaviors, hyperactivity, and aggression. In light of the complexity inherent in studying such heterogeneous constructs, the current study concentrated on aggression while considering the relevant but broader literature on externalizing behavior. The present study focused on relationships between internalizing symptoms, specifically depression and anxiety, and aggression, as well as individual differences in particular reactive and self-regulatory processes that might account for these relationships.

A common factor underlying anxiety and depression is negative affect (NA; Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Lambert, McCreary, Joiner, Schmidt, &

Ialongo, 2004; Lonigan, Phillips, & Hooe, 2003), defined as the experience of aversive mood states, such as feeling upset, angry, guilty, afraid, sad, scornful, disgusted, and worried (Clark & Watson, 1991). NA is a pervasive and stable personality trait that has been conceptualized as a reactive component of temperament and related to other personality dimensions such as Neuroticism and emotionality (Watson & Clark, 1984), and distinguished from effortful components of temperament that are involved in voluntary self-regulation (Derryberry & Rothbart, 1997).

Although there is some evidence that both anxiety (e.g., Diener & Iran-Nejad, 1986; Drabick, Ollendick, & Bubier, 2010) and depressive symptoms (e.g., Angold & Costello, 1993; Kazdin, Esveldt-Dawson, Unis, & Rancurello, 1983; Marmorstein & Iacono, 2003) are associated with higher levels of aggression, this association may be more clear for depression than for anxiety. First, there is evidence that anxiety can be a protective factor that makes aggressive behavior less likely to occur (e.g., Walker et al., 1991). Second, there appears to be considerable heterogeneity in the relationships between the various presentations of anxiety and aggression. For example, in a sample of treatment-seeking adults and non-clinical controls, Moscovitch, McCabe, Antony, Rocca, and Swinson (2008) found that before controlling for depression, participants with obsessive-compulsive disorder (OCD), social phobia (SOC), and panic disorder (PD) were more likely to experience anger than controls, whereas those with specific phobias (SPC) were not. Subjects with PD were the only group to both experience and express more aggression than the control group. Furthermore, when levels of depression were accounted for, the only remaining difference between anxiety disorder groups was the increased levels of anger in PD. Whiteside and Abramowitz (2005) found similar results in a sample of adults with OCD. In addition, DeWall, Buckner, Lambert, Cohen, and Fincham (2010) found

that, in an undergraduate sample, people with more social anxiety tend to report increased hostile feelings, but demonstrate fewer hostile behaviors than those who report lower levels of social anxiety.

In contrast to the connection between anxiety and aggression, there is more consistent evidence for the association between depression and aggression, a link that is evident in childhood and appears to persist into early adulthood. For instance, in a school-age community sample, Messer and Gross (1994) found a correlation between depression and aggression ($r = 0.56, p < 0.05$) that was similar in magnitude to the one observed by Gjone and Stevenson (1997) for internalizing and externalizing disorders overall. This association between depression and aggression in children is consistent with findings from studies of adolescents (e.g., Kazdin et al., 1983; Lefkowitz & Tesiny, 1980, 1985). Hale et al. (2008) demonstrated that depressive symptoms in a community sample of early adolescents predict aggression as much as one year later. Similarly, in a longitudinal community study, Keenan-Miller, Hammen, and Brennan (2010) found that even when the association between aggression and depression at age 15 was taken into account, youth depression significantly predicted aggression in early adulthood. Furthermore, youth depression fully mediated effects of maternal depression on later aggression.

In his 1983 review exploring various factors that affect the manifestation of aggression, Berkowitz suggested that the pain and suffering experienced by depressed people contribute to the disposition to aggression. In a subsequent investigation with Finman (1989), Berkowitz demonstrated experimentally that anger and hostility could be evoked in an undergraduate female sample by generating depressive feelings using a set of mood induction statements, particularly when little time for reflection was allowed. Similarly, Hynan and Grush (1986) found that impulsive male undergraduates in an induced state of depression behaved more

aggressively in a laboratory aggression paradigm than those who did not receive the depression induction.

Building on his work with Finman and others, Berkowitz revised the frustration-aggression hypothesis originally described by Dollard and colleagues in 1939. Berkowitz's (1989) revised frustration-aggression model explicitly linked depression to aggression via NA. Specifically, Berkowitz contended that only when frustration increases NA will it contribute to aggression. Although he did not directly refer to anxiety, Berkowitz suggested that any type of NA will lead to increased aggression, implying that the model holds for both depression and anxiety. Consistent with this revised model, displays of NA have been found to predict aggressive behaviors in social situations for toddlers and children (Calkins, Gill, Johnson, & Smith, 1999; Rubin, Coplan, Fox, & Calkins, 1995).

Since NA can include other negative emotions besides anger, such as fear and sadness, Berkowitz (1989) further posited that the interpretation of NA as anger is a key step in connecting the experience of aversive stimuli to an aggressive response; however, findings regarding this component of the model appear mixed. Research on community adult samples by Zuckerman and colleagues (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) supports this distinction between aggressive and non-aggressive NA, noting that within a five-factor structural model of personality, the anger, aggression, and hostility scales formed a separate factor from the neuroticism-emotionality factor that captured other negative emotions. Similarly, Evans and Rothbart (2007) found empirical support in non-clinical adult samples that NA comprises two separate but correlated factors, with fear, sadness, and discomfort forming the non-aggressive factor, and frustration, social anger, and aggression control making up the factor of aggressive NA. In adults, a non-clinical twin sample demonstrated that angry negative emotional

responding predicted higher aggression levels (Chen, Coccaro, & Jacobson, 2012). However, a multi-national non-clinical study of adolescents found that the relationship between higher NA and increased aggression can still occur even when NA is not specifically anger-related (Caprara, Barbaranelli, Pastorelli, Cermak, & Rosza, 2001). Thus, NA may be a general risk factor for both internalizing symptoms and aggression. Notably, the majority of these studies did not control for anxiety when measuring depression, which introduces a possible confound into the relationship between depression and aggression. Furthermore, they did not consider voluntary components of self-regulation that may affect such relationships.

Effortful control. In addition to being a risk factor for internalizing and aggressive behavior, NA has also been shown to be inversely associated with effortful control (EC; e.g., Derryberry & Rothbart, 1988; Kochanska, Murray, & Harlan, 2000). Effortful control is one of the many related but somewhat distinct concepts that have been included under the umbrella of self-regulation. It includes attentional control (AC), or the ability to shift and focus attention, as well as inhibitory control (INH), the ability to inhibit a dominant response, and activation control (ACV), the capacity to perform an action when there is a strong tendency to avoid (Rothbart & Bates, 1996). EC shows substantial development over the toddler and preschool years, and becomes increasingly stable across situations and time (Kochanska & Knaack, 2003; Rothbart, 2007). The AC and INH components are conceptually distinguishable but show considerable overlap, with typical correlations around $r = .25$ (Derryberry & Rothbart, 1988). While much of the research, particularly in children, have investigated EC broadly as a potential protective factor against internalizing and externalizing symptoms, some studies in this area have separately considered the role of AC or INH. Thus, although the present study examined EC broadly at the

factor level, the literature on these sub-factor components will be briefly reviewed herein and later revisited based on this study's findings.

Racer and Dishion (2011) noted in their recent review that AC is particularly relevant to both internalizing and externalizing disorders in children, arguing that deficits in AC could lead to both depression and conditions such as conduct disorder (CD), which is characterized by high levels of aggression. The Attentional Control Theory described by Eysenck, Derakshan, Santos, and Calvo, (2007) supports the relationship between anxiety and AC deficits, noting that anxiety can have adverse effects on the ability to shift and inhibit attention. This theory is consistent with Derryberry and Reed's (2002) prior finding in an undergraduate sample that AC moderates anxiety-related attentional bias to threat. Research has also connected deficits in AC to depression, though typically not in relation to threat. AC has been linked to the ability to forestall the ruminative patterns of cognition that could prolong and worsen depressive states by directing attention away from negative thoughts (Joormann, Yoon, & Zetsche, 2007). Frings, Wentura, and Holtz (2007) found support for this model in a sample of undergraduate students. Their study observed that students with higher scores on a depression inventory had more difficulty ignoring irrelevant negatively valenced stimuli. A study on Icelandic undergraduates by Ólafsson et al. (2011) expanded on this connection between internalizing disorders and AC by looking at the focusing and shifting components individually. The study found that the focusing aspect of AC predicted anxiety scores when controlling for depression, while the shifting aspect was related to depression when anxiety was controlled.

The INH aspect of EC has not been as frequently studied in connection with internalizing symptoms, and the research that has been done seems to paint a more complex picture than for AC. One possible reason for this added complexity is that factor loadings for INH tend to be less

reliable than for AC (Evans & Rothbart, 2007). Another possible explanation is that due to an overlap in terminology, “inhibitory control” is often conflated with “behavioral inhibition,” while in reality the constructs are quite distinct (Eisenberg, Sadovsky, et al., 2005). INH is involved in suppressing inappropriate approach responses, while behavioral inhibition is usually related to constrained behavior in stressful situations and often *produces* inappropriate responses. Although typically conceptualized as behavior-focused, there has been some indication that due to the difficulty in separating inhibition of behavior from cognition, INH may account for some aspects of *cognitive* inhibition that are not otherwise captured by AC (Aron, 2007; Buffington, 2009). One possible illustration of this perspective is a recent study that investigated the relationship between memory recall, depression, and INH (Raes, Verstraeten, Bijttebier, Vasey, & Dalgleish, 2010). This study demonstrated that INH partially mediated the connection between overgeneral memory recall and depression symptoms. Thus, reduced INH may explain the association between depressed mood and having difficulty recalling specific autobiographical information.

Effortful control and externalizing behavior. There has been considerable evidence in the child literature that low levels of EC also predict externalizing symptoms (e.g., Eisenberg, Sadovsky, et al., 2005; Eisenberg, Zhou, et al., 2005; Murray & Kochanska, 2002; Valiente et al., 2003; Zhou et al., 2007). This connection between EC and aggression has not been as clearly established for adult populations. However, executive function, a construct closely related to EC (Zhou, Chen, & Main, 2011), was found to be poor in men with aggressive personality disorders (Dolan, Deakin, Roberts, & Anderson, 2002). These results correspond to the findings of a meta-analysis by Morgan and Lilienfeld (2000) showing that, overall, the performance of antisocial groups on measures of executive functions was .62 standard deviations worse than comparison

groups, indicating a medium to large effect size. It should be noted, however, that this meta-analysis included various operationalizations of executive functions as well as antisocial behavior, which typically included rule-breaking and irresponsible behavior in addition to aggression.

Though less frequently studied in relation to externalizing than to internalizing symptoms, a connection between the AC component of EC and externalizing symptoms has been noted in several studies. In a longitudinal child study, Valiente et al. (2003) found that the AC component of EC had a significant negative relationship with externalizing behaviors, although the authors did not report on aggression separate from other externalizing behaviors. In addition to significant negative correlations between internalizing symptoms and AC, Muris, Van Der Pennen, Sigmond, and Mayer (2008) also noted a significant, though less notable, negative correlation between AC and aggression. Interestingly, a stronger negative correlation was observed between aggression and scores on the Effortful Control Scale (ECS; Muris, 2006), indicating that while AC alone may be related to aggression, EC as a whole, or non-AC aspects of EC, may be more relevant to this relationship.

Evidence of an association between INH and externalizing symptoms has also been noted in prior research with children. For example, Eisenberg and colleagues (2005) investigated the link between adult-reported EC and children's externalizing symptoms, and found the strongest connection for children high on externalizing and INH – though notably a less robust yet still significant relationship was also found between externalizing symptoms and AC. Notably, a number of studies have investigated INH and externalizing symptoms using behavioral measures of INH rather than reports. For instance, Brophy, Taylor, and Hughes (2002) observed that “hard to manage” children demonstrated considerably impaired INH abilities as measured by a

computerized Go-No-Go task. However, behavioral measures of effortful control have typically been found to have little correlation with report measures (Zhou et al., 2011), limiting generalizability of findings.

In light of this body of evidence that both AC and INH exhibit some relationship with internalizing and externalizing symptoms, for this study EC was considered broadly as a protective factor which moderates NA.

Interactions between negative affect and effortful control. While NA and EC have been shown in separate studies to correspond to internalizing and externalizing symptoms, the juxtaposition of high levels of negative affect and low levels of self-control may create the greatest risk for internalizing and externalizing symptoms, as well as for their co-occurrence. For instance, Derryberry and Reed (2002) demonstrated in adults that attentional control can modulate the impact of threatening information by allowing individuals to override more automatic, reactive bias toward the processing of threat cues in the environment. Lonigan and Phillips (2001) extended this framework to children and broadened it to consider interactions between NA and EC, proposing that the combination of both high NA and low EC is necessary for the development of anxiety problems. This model has been supported in child and youth samples (Lonigan, Vasey, Phillips, & Hazen, 2004) as well as in a community sample of adults (Healy, 2010). In an undergraduate sample, Healy found that high NA and low attentional control, as well as reduced parasympathetic tone (which serves as a psychophysiological marker of poorer self-regulation, e.g., Porges, 1995) significantly predicted high levels of anxiety. This moderation of NA (here characterized as Neuroticism) by EC has been demonstrated more generally in non-clinical children's internalizing symptoms by Muris and colleagues (Muris, Meesters, & Rompelberg, 2007; Muris, 2006). A study by Buffington (2009) investigated this

connection for depression in an undergraduate sample and found evidence that AC moderated the connection between negative reactivity and depressive symptoms. Similarly, a study looking at both cross-sectional and prospective data found that the interaction between high NA and low EC was related to more depressive symptoms in a community adolescent sample (Verstraeten, Vasey, Raes, & Bijttebier, 2009).

Some studies have also considered the moderating role of EC on NA in predicting externalizing behavior. A study on an adult community sample by Jensen-Campbell, Knack, Waldrip, and Campbell (2007) found Conscientiousness, the Big Five personality factor found to overlap with effortful control (e.g., Evans & Rothbart, 2007), to mediate the relationship between anger (part of NA) and aggression. A longitudinal, non-clinical child study by Kim and Deater-Deckard (2011) found a similar relationship between angry NA and attention control in the development of externalizing problems from age 4 to 11. They also found that this relationship did not decline over time, which suggests that these risk factors may contribute to aggression in adulthood. A review on personality and temperament characteristics by De Pauw and Mervielde (2010) also noted that lower EC and higher NA (with NA measured as low Agreeableness/high anger) were associated with youths with high levels of aggressive behavior. Valiente et al. (2003) also observed that the interaction between EC and negative emotionality significantly predicted the amount of externalizing problem behaviors in a longitudinal child sample. Importantly, a study on Dutch adolescents by Oldehinkel, Hartman, Ferdinand, Verhulst, and Ormel (2007) noted that the interaction between negative emotionality and EC was significantly related to both internalizing and externalizing problems, though they did not look specifically at anxiety, depression, or aggression. Collectively, these findings suggest that EC may moderate the effect of NA on both internalizing and externalizing symptoms, such that high levels of NA combined

with low levels of EC may create a particular vulnerability to both internalizing symptoms and aggression.

Subtypes of aggression. Aggression itself is notably heterogeneous, but research suggests it comprises two main functional subtypes, reactive and proactive (e.g., Dodge, 1991; Miller & Lynam, 2006). Reactive aggression is essentially “hot-blooded,” involving an aggressive response to some trigger. Proactive aggression, on the other hand, can be considered “coldblooded,” as it tends to involve aggressive acts which are premeditated and unprovoked (Baker et al., 2008). Reactive and proactive aggression are typically found to be moderately correlated according to traditional analyses, but have also been shown to be separable constructs which have distinguishable relationships with other psychosocial constructs (e.g., Ollendick, Jarrett, Wolff, & Scarpa, 2009). Since proactive aggression has been associated with the ability to plan and regulate behaviors (Ellis, Weiss, & Lochman, 2009) whereas reactive aggression is a frustration response characterized by self-regulatory difficulties (Dodge et al. 1997; Hubbard et al. 2002) which is connected with more impulsive actions, deficits in EC should function as a risk factor for reactive and not proactive aggression. This negative correlation between EC and reactive aggression has been found in a community sample of children ages 9-12 by (Rathert, Fite, Gaertner, & Vitulano, 2011). Although this study did not consider the role of NA, De Pauw and Mervielde’s (2010) review noted observations by Frick and White (2008) and Nigg (2006) that indicate the interaction between low EC and high NA are associated with reactive and not proactive aggressive behavior.

Few studies to date have considered the interaction between EC and NA as a potential common mechanism in the observed frequent co-occurrence between internalizing symptoms and aggression, particularly for adults. Furthermore, the majority of studies on interactions

between EC and NA on internalizing symptoms do not conceptually or methodologically differentiate between anxiety and depression, and most studies on such interactions in aggression do not differentiate between the functional subtypes. The proposed study attempts to address these limitations in the literature.

Hypotheses. The current study seeks to further investigate relationships between NA, EC, aggression, depression and anxiety in young adults. Evidence from the aforementioned studies supports the model that the interaction between low effortful control and high negative affect can lead to internalizing and externalizing problems. In accordance with this model, the following hypotheses were proposed:

Hypothesis 1. Depression and anxiety are each associated with reactive and not proactive aggression.

Hypothesis 2. Negative affect interacts with effortful control to predict both depression and anxiety.

Hypothesis 3. The interaction between negative affect and effortful control predicts reactive aggression, but not proactive aggression.

Hypothesis 4. The interaction between negative affect and effortful control functions as a common mechanism that predicts both depression and reactive aggression; thus when the interaction term is included in the model, the apparent association between depression and reactive aggression will decrease (see Figure 1).

Methods

Participants

The participants for the study were a convenience sample of 921 Virginia Tech undergraduates, ages 18-36, as part of a larger study approved by the VT Institutional Review Board (see Appendix A). The sample is approximately 71.4% female and primarily Caucasian (81.1% Caucasian, 7.4% Asian, 2.9% African-American, 2.1% Hispanic, 3.4% multiracial, and 3.1% other). To recruit participants, extra credit in psychology courses was offered for survey completion, flyers for an “Adult Personal Experiences Survey” were posted around the Psychology Department, and invitations were distributed to introductory psychology classes.

Based on the typically modest size of moderation effects (e.g., Aiken & West, 1991), a small effect size was anticipated for the predicted interactions. An *a priori* power analysis using G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007) for a linear multiple regression model was conducted using a small effect size of $f^2 = 0.02$ and alpha of .05 found that $n_{total} = 822$ for adequate power (0.95), indicating that 921 was a sufficient sample size.

Measures

The study used self-report questionnaires presented to participants using SurveyMonkey (<http://www.surveymonkey.com/>), a survey website as part of a larger study. At the beginning of the online survey, participants completed a brief demographics questionnaire that asked about information such as their age, gender, ethnicity, and socioeconomic status. In addition to the demographic data, the following measures were included in the present study.

Patient Health Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999). Participants’ level of depression was operationalized using the PHQ, an 11-item measure of clinical disorders. Depression is measured by one item with multiple sub-questions which address specific symptoms of depression and how frequently they occur (see Appendix B). Higher frequency and

number of symptoms endorsed indicates higher levels of depression. This measure has been shown to have good agreement with diagnoses by independent mental health professionals, with overall accuracy of 85%, sensitivity of 75%, and specificity of 90% (Spitzer et al., 1999). In addition, a meta-analysis of 14 studies found the PHQ to be validated for Major Depressive Disorder in adults, including non-clinical undergraduates (Gilbody, Richards, Brealey, & Hewitt, 2007). The PHQ has been used to operationalize depression in several other studies on college populations (e.g., Garlow et al., 2008; Young, Fang, & Zisook, 2010; Young, Fang, Golshan, Moutier, & Zisook, 2012). In the current study, Cronbach's α for the PHQ was .83.

State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000; Ree, French, MacLeod, & Locke, 2008). The STICSA is a 21-item measure that consists of both cognitive (10 items; e.g., "I feel agonized over my problems" and "I think that the worst will happen") and somatic (11 items; e.g., "My palms feel clammy" and "I feel dizzy") dimensions of anxiety. Each item is a statement which respondents rate on a 4-point scale according to frequency of occurrence (see Appendix C). The STICSA has been found to have higher convergent and discriminant validity than the State-Trait Anxiety Inventory (STAI), a frequently-used measure (Elwood, Wolitzky-Taylor, & Olatunji, 2011; Grös, Antony, Simms, & McCabe, 2007). It also showed excellent internal consistency (Cronbach's $\alpha = .88$ for the Cognitive and Somatic State subscales, and .87 for both subscales of the STICSA Trait) as well as construct validity (Grös et al., 2007) and has been validated for undergraduate samples (Ree et al., 2008). In the current study, Cronbach's $\alpha = .83$ for the Somatic subscale and $\alpha = .90$ for Total anxiety.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item scale that consists of words and phrases that describe either positive or

negative affect feelings (see Appendix D). Each item is rated on a 1 to 5 scale as to what extent they are felt (1 = “not at all/slightly,” 5 = “extremely”). These ratings are used to create separate scores for positive affect and negative affect, but for this study only the positive affect scale from the PANAS was used. This measure has been shown to have good internal consistency ($\alpha = .87$), and has been validated on undergraduate samples (Watson et al., 1988). The correlation between negative and positive affect in the validating sample was found to be $r = -.17$. For the positive affect scale of the PANAS, $\alpha = .83$ in the present study.

Adult Temperament Questionnaire (ATQ; Rothbart, Ahadi, & Evans, 2000). The short form of the ATQ is a 77-item instrument with items rated on a 7-point scale (Appendix E). The questionnaire contains four principal scales: negative affect, extraversion, effortful control, and orienting sensitivity, each in turn consisting of subscales. For the purposes of this study, the Effortful Control (EC) scale was used as a measure of self-regulation. Remaining EC items from the long form of the ATQ were included in the survey battery and merged with the EC scale from the short form. The EC scale consists of subscales assessing attentional control (the capacity to focus and shift attention), inhibitory control (the capacity to suppress inappropriate approach behavior), and activation control (the capacity to perform an undesired activity). The attentional control subscale of the ATQ has been found to have good internal consistency (Cronbach’s $\alpha = .88$), although the consistency of the inhibitory control subscale is lower ($\alpha = .66$). As a whole, the EC scale has sufficient convergent and discriminant validity for undergraduate samples (Evans & Rothbart, 2007, 2009). The negative affect scale of the ATQ was used to assess NA. It consists of six subscales: discomfort (unpleasant affect resulting from the sensory qualities of stimulation), fear (unpleasant affect related to anticipating pain or distress), sadness (unpleasant affect and lowered mood and energy related to object or person

loss, disappointment, and exposure to suffering), frustration (unpleasant affect related to the interruption of tasks and behavior), social anger (hostility felt toward other people), and aggression control (the capacity to inhibit the behavioral expression of anger). Cronbach's alpha for these subscales in the initial college sample ranged from .72 to .84, demonstrating good internal consistency among items (Evans & Rothbart, 2007). The correlation between NA and EC items in this sample was found to be $r = -.50$. In the present study, EC scale $\alpha = .80$ and NA scale $\alpha = .90$.

Reactive Proactive Aggression Questionnaire (RPQ; Raine et al., 2006). The RPQ is a 23-item interval scale that asks participants to rate each question in terms of frequency and occurrence on a 3-point scale (0 = "never," 1 = "sometimes," 2 = "often"). The measure consists of 12 items indexing proactive aggression (e.g., "Vandalized something for fun" and "Had fights with others to show who was on top") and 11 items on reactive aggression (e.g., "Gotten angry when frustrated" and "Reacted angrily when provoked by others"; see Appendix F). Factor analysis of this measure has provided support for the reliability (Cronbach's $\alpha = .81-.86$ for RA; $.84-.87$ for PA) and construct validity of the two scales in both undergraduate and adolescent samples (Miller & Lynam, 2006; Raine et al., 2006). Although the two scales were found to be valid, RA and PA were also found to be significantly correlated ($r = .54$; $r = .71$ when corrected for unreliability) in a college sample (Miller & Lynam, 2006), consistent with other measures of reactive and proactive aggression ($r = .70$ in a meta-analysis by Polman, Orobio de Castro, Koops, Van Boxtel, & Merk, 2007). In the current study, $\alpha = .83$ for RA and $\alpha = .86$ for PA.

Procedure

This study involves analyses of data that were collected as part of a larger cross-sectional study that was approved by the university Institutional Review Board. Participants who elected

to enroll for the study were given a code to access the online survey in SurveyMonkey. There they read information about the survey (see Appendix A) and entered their email address to acknowledge informed consent before continuing. Participants then completed a battery of self-report measures consisting of questions pertaining to personality, aggression, self-regulation, emotions, anti-social behaviors, and self-esteem, among other topics. Subjects received extra credit for consenting to participate in the study.

Data Analysis

A series of hierarchical linear regressions were conducted to test the hypothesized predictions. Before running primary analyses, the data were screened for careless responding and for violations of assumptions for multiple linear regression following Tabachnick and Fidell (2001). Only participants who completed all measures used in this study were included in analyses. A response was required for each item in order for participants to continue in the online survey. Four true/false validation questions were interspersed among the measure items to detect careless or random responding. Two items were worded such that a “true” response would indicate careless or random responding (“While responding to questions here I save time by just answering randomly,” and “I am not paying much attention to what I am doing at the moment”) and two were coded so that a “false” response would indicate careless responding (“In completing these items, I think before giving a response,” and “I am being careful about the responses I am giving on this survey”). Valid (careful) responding was operationalized *a priori* as two or more correct responses out of four. Based on this criterion, out of the participants who completed all measures for this study, 6.3% missed two or more of these questions and were therefore deemed careless responders and casewise deleted. Remaining cases were then screened for outliers. Univariate outliers were identified as those exceeding twice the value of the

interquartile range. To prevent undue influence, outlying but valid scale scores were lowered to twice the interquartile range value ($n = 116$ cases with at least one univariate outlier, 12.6% of final sample). Eight multivariate outliers were found and excluded from analyses. All continuous independent variables were mean-centered prior to analyses. Two variables, depression and proactive aggression, were found to have non-normal distributions, but there were no notable differences between analyses with the original variables and those with log-transformed variables. Therefore, the analyses using the untransformed variables are reported here. Alpha level was set *a priori* at .05.

Each of the regression models were tested separately for depression and anxiety predicting reactive or proactive aggression while controlling for the alternate functional subtype. In accordance with the Tripartite Model, physiological hyperarousal was covaried in the tests regarding depression, and anhedonia was covaried in tests of anxiety. Similarly, to examine unique associations between depression or anxiety and reactive or proactive aggression the alternate function of aggression (reactive or proactive) was covaried, which is a common practice for this type of measure (e.g., White & Kistner, 2011).

The difference in regression coefficients before and after including the proposed common mechanism of the interaction between NA and EC was tested using Freedman and Schatzkin's (1992) approach, based on recommendations by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002). This approach tests the difference in regression coefficients, before and after inclusion of the interaction term EC x NA, by producing a critical t -value as a test of the null hypothesis that the difference between the adjusted and unadjusted regression coefficients for the relationship between the IV and DV is zero ($H_0: \tau - \tau' = 0$). Squared semi-partial correlations were used to estimate effect sizes ($sr_{\tau}^2 - sr_{\tau'}^2 / sr_{\tau}^2$).

Results

Bivariate correlations and descriptive statistics for the sample are provided in Table 1. Gender was significantly correlated only with negative affect ($r = -.126, p < .001$), while age was unrelated to any other variable (all $ps > .139$). All remaining variables were significantly correlated with each other, except positive affect and proactive aggression ($r = -.058, p = .083$). Effortful control was inversely related to all other predictor and criterion variables except gender, age, and positive affect, to which EC was positively related. Positive affect was inversely related to the other variables except gender (Table 1).

Gender was included in the model analyses as a potential moderator since aggression and depression tend to differ by gender (Driscoll, Zinkivskay, Evans, & Campbell, 2006; Kessler, 2003). There is also evidence that the type of negative affect (e.g., angry or sad) may be more important in women than in men (Verona, 2005). Despite this evidence, there were no significant main or interaction effects of gender in this study. Thus to simplify presentation, gender results are not further described herein.

Hypothesis 1: Depression and anxiety are each associated with reactive and not proactive aggression.

The first regression model tested the prediction that depression is associated with reactive and not proactive aggression (Table 2). Reactive aggression scores from the RPQ were first regressed on EC subscale scores from the ATQ. In the next step, depression scores from the PHQ were then entered as a main effect variable. The same analysis was repeated using anxiety scores from the STICSA instead of depression, and both of these analyses were repeated with proactive aggression as the dependent variable, controlling for reactive aggression. As predicted, depression and anxiety were associated with reactive aggression (depression: $b^* = .108, p < .001$;

anxiety: $b^* = .130, p < .001$) but not proactive (depression: $b^* = -.029, p = .323$; anxiety: $b^* = .033, p = .238$).

Hypothesis 2: Negative affect interacts with effortful control to predict both depression and anxiety.

A second set of hierarchical regressions were conducted to test the prediction that the interaction between negative affect and effortful control predicts depression and anxiety (Table 3). In the first step, PHQ depression scores were regressed on negative affect and effortful control subscale scores from the ATQ. The interaction term for EC and NA were added in the next step. To test if this relationship holds for anxiety, STICSA score was entered in the first step and PHQ scores were excluded. The interaction of EC and NA was found to predict depression ($b^* = -.062, p = .030$.) but not anxiety ($b^* = -.025, p = .429$).

This interaction was probed following Aiken and West's (1991) method of calculating simple slopes for conditional effects of NA on depression at three values of EC (sample mean, one standard deviation above, and one standard deviation below), and graphing the results. Simple slope tests indicated a significant positive relationship between NA and depression at each level of EC (low: $b^* = .36, p < .001$; mean: $b^* = .30, p < .001$; high: $b^* = .24, p < .001$). As illustrated in Figure 2, the positive association between NA and depression increases as EC decreases.

Hypothesis 3: The interaction between negative affect and effortful control predicts reactive aggression, but not proactive aggression.

A third set of regressions were conducted to test whether the interaction between EC and NA predicts reactive aggression when controlling for proactive aggression (Table 4). In the first step EC and NA scores were entered into the model. Depression scores were also entered in this

step as a main effect. The interaction term for EC x NA was then entered as the final step. Analyses were subsequently repeated, replacing anxiety for depression, and subsequently switching RA and PA in the model to determine whether the proposed common mechanism works for anxiety and to test the hypothesis that the relationship does not hold for proactive aggression. Contrary to predictions for Hypothesis 3, the interaction of EC and NA was not found to significantly predict reactive aggression when depression ($b^* = -.013, p = .610$) or anxiety ($b^* = -.016, p = .546$) was entered as a main effect.

Hypothesis 4: The interaction between negative affect and effortful control functions as a common mechanism that predicts both depression and reactive aggression.

Freedman and Schatzkin's (1992) difference in coefficients method was used to compare the coefficient for depression when the interaction term was not included (regression from Hypothesis 1) to the coefficient when the interaction term was included (regression from Hypothesis 3) to test the hypothesis that the interaction between EC and NA serves as a common mechanism that predicts both depression and RA. A significant decrease in the association between depression and RA when the EC x NA interaction term is included lends support for the conjecture that the EC x NA interaction functions as a potential mechanism in the depression-RA association. The process was repeated for the models with anxiety as a main effect, to likewise determine whether the interaction of EC and NA potentially functions as a common mechanism in the association between anxiety and RA.

For depression, the Freedman and Schatzkin (1992) test indicated a significant difference in coefficients representing the association between depression and RA when EC x NA was added as a common mechanism ($t = 50.072, p < .001$). Using the squared semi-partial correlations to calculate effect size demonstrated that EC x NA accounted for 69.1% of the

association between depression and RA, which is supportive of the common mechanism prediction. There was also a significant difference in coefficients for anxiety ($t = 8.049, p < .001$), and the interaction accounted for 12.3% of the association between anxiety and RA. To explore whether the role of EC x NA may be stronger in the depression-RA link than in the anxiety-RA link, confidence intervals were then constructed around the Freedman and Schatzkin (1992) t -test values for anxiety and depression. For anxiety and depression, 95% CIs [.006, 1.984] and [.044, 1.984] were found, respectively. The overlap between the two CI ranges suggested that there was not a significant difference in the role of EC x NA in the depression-RA association and anxiety-RA association.

Subsidiary analyses: Does the difference in coefficients vary between levels of effortful control or by gender?

Two subsidiary sets of regression analyses also were run to determine whether differences caused by inclusion of the EC x NA common mechanism term in the depression-RA link or anxiety-RA link (i.e. $\tau - \tau'$, indexed by the Freedman and Schatzkin t -test), vary by level of EC [$H_0: (\tau_{\text{highEC}} - \tau'_{\text{highEC}}) - (\tau_{\text{lowEC}} - \tau'_{\text{lowEC}}) = 0$] or by level of gender [$H_0: (\tau_{\text{male}} - \tau'_{\text{male}}) - (\tau_{\text{female}} - \tau'_{\text{female}}) = 0$]. For the first set, RA was regressed on EC, gender, and depression in the first step, and then on the EC x depression and gender x depression interaction terms. In a separate regression, the same steps were followed substituting anxiety for depression. These analyses were repeated with proactive aggression as the dependent variable. There was no significant interaction with EC for either depression ($b^* = .04, p = .102$) or anxiety ($b^* = -.02, p = .366$), or between gender and either depression ($b^* = -.01, p = .651$) or anxiety ($b^* = -.02, p = .608$), indicating that the association between them and RA was not moderated (Table 5).

The second set of analyses tested whether the association between depression and RA varied by level of EC or gender when EC x NA was included in the model. First, RA was regressed onto depression, NA, and EC. In the next step, the interaction term between NA and EC was added, and in the final step, the interaction term between EC and depression was added. This analysis was repeated for anxiety and for proactive aggression. There was no significant EC x depression ($b^* = .05, p = .098$), EC x anxiety ($b^* = -.02, p = .564$), gender x depression ($b^* = -.02, p = .622$), or gender x anxiety ($b^* = -.01, p = .771$) interaction when EC x NA was entered into the model, indicating that the depression-RA link, and the anxiety-RA link, was not moderated by EC or gender (Table 6).

Follow-up analyses

Although the Freedman and Schatzkin (1992) t-test indicated a significant difference in coefficients for Hypothesis 4, indicating that inclusion of the EC x NA interaction term affected the depression-RA link and the anxiety-RA link, it was also observed that the EC x NA interaction was only significantly associated with depression (as shown in the analyses for Hypothesis 2, Table 3); it was not significant for RA or anxiety, contrary to predictions. Therefore, further analyses were conducted on simplified models to clarify specific relationships between NA and EC with depression, anxiety, and RA.

1) Do EC and NA interact to predict depression, anxiety, and reactive aggression?

First, main effects of EC and NA on depression, anxiety, and RA were separately tested in individual regressions, along with the respective covariates for each criterion variable (i.e., somatic anxiety for depression, positive affect for anxiety, and proactive aggression for RA). Significant main effects emerged for both EC ($b^* = -.323, p < .001$) and NA ($b^* = .373, p < .001$) on depression and for EC ($b^* = -.143, p < .001$) and NA ($b^* = .096, p = .004$) on anxiety.

Significant main effects for EC ($b^* = -.163, p < .001$) and NA ($b^* = .214, p < .001$) were also found for RA. However, when the interaction term EC x NA was added, it was again only significant for depression ($b^* = -.065, p = .026$) and not for anxiety ($b^* = -.033, p = .312$) or for RA ($b^* = -.022, p = .393$). These findings suggest that, rather than the EC x NA interaction functioning as a common mechanism in the link between depression or anxiety and RA, EC and NA interact to predict depression, but individually and additively predict anxiety and RA. Thus, the significant difference in coefficients test might actually reflect both interactive and additive effects of EC and NA, rather than a consistently moderated mechanism.

2) Do EC and NA interact to predict depression, anxiety, and reactive aggression individually?

To investigate further the possibility that additive rather than interactive effects of EC might explain the significant difference in coefficients when EC x NA is added to the model, the three regressions for Hypotheses 1-3 were conducted with EC or with NA in isolation, rather than the interaction term serving as the common mechanism. For depression and RA, the Freedman and Schatzkin (1992) test indicated a significant difference in coefficients for both EC ($t = 37.454, p < .001$) and NA ($t = 70.754, p < .001$), supporting the individual roles of EC and NA as common mechanisms in the depression-RA link. There was also a significant difference in coefficients for anxiety and RA for both EC ($t = 43.062, p < .001$) and NA ($t = 18.110, p < .001$), supporting the individual roles of EC and NA as common mechanisms in the anxiety-RA association.

Discussion

Consistent with predictions and previous research (e.g., Angold & Costello, 1993; Diener & Iran-Nejad, 1986), depression and anxiety were both found to be associated with aggression. Furthermore, these findings extend prior research on the associations between these variables by demonstrating that depression is uniquely associated with aggression after controlling for physiological hyperarousal, and that anxiety is also uniquely associated with aggression after controlling for anhedonia. In addition, these associations were demonstrated to be specific to reactive and not proactive aggression, as predicted. It was also found that effortful control did not moderate these associations between depression and anxiety and aggression.

The interaction between effortful control and negative affect significantly reduced the association between depression and reactive aggression, and between anxiety and reactive aggression, as predicted by the moderated common mechanism (EC x NA) hypothesis. However, closer inspection revealed that this interaction of effortful control and negative affect was only predictive of depression, and not of anxiety or reactive aggression. Specifically, effortful control and negative affect interacted such that lower levels of effortful control combined with higher negative affect predicted higher levels of depression, as found in previous studies (Buffington, 2009; Verstraeten, Vasey, Raes, & Bijttebier, 2009).

Contrary to predictions, the EC x NA interaction was not associated with either anxiety after controlling anhedonia, or with reactive aggression after controlling proactive, in contrast to the conceptual framework proposed by Lonigan and Phillips' (2001), as well as a previous study on undergraduates by Healy (2010) which found high negative affect and low attentional control to predict high levels of anxiety. The fact that the EC x NA interaction failed to predict aggression in this study was also contrary to a more limited body of prior evidence which found

the interaction of negative emotionality and effortful control was associated with externalizing problems in children (Valiente et al, 2003). This discrepancy could be due to a number of factors. Valiente and colleagues, for example, investigated externalizing behaviors more broadly, rather than focusing on aggression specifically. Interestingly, they initially failed to find a significant interaction when using structural equation modeling, but were able to detect an interaction upon creating composite variables from their measures for each construct and conducting regression analyses, suggesting the importance of construct operationalizations or analytic strategy on findings.

Follow up analyses indicated that the EC x NA interaction accounted for a significant portion of the relationship between depression and reactive aggression, and between anxiety and reactive aggression, because effortful control and negative affect play a role in both internalizing symptoms and reactive aggression. However, the role these factors play differs. For depression, effortful control and negative affect appear to interact as risk factors. In contrast, for anxiety and reactive aggression, the effects of negative affect and effortful control seem to be additive. Thus, negative affect and effortful control are both important predictors (at least concurrently) of internalizing symptoms and reactive aggression, but the way they operate together differs.

There are several limitations to this study. First, all measures were self-report, indicating that the results could be influenced by shared method variance. Including other types of measures and sources of reporting (e.g., performance measures, clinician interviews, and observer reports) would eliminate this possibility. There is also an increased possibility of careless or invalid responding since the measures were completed as part of a long online survey, though the data was screened for invalid responses and participants were cautioned to provide valid answers or they would not be invited to continue the survey. The lack of experimental or

longitudinal data necessarily prevents firm conclusions regarding causality from being drawn. Another possible limitation of the self-report measures used in this study was described by Dinovo and Vasey (2011). They noted that the scales of the PANAS seem to overlap substantially with effortful control scales, which could diminish the ability to detect interactions when these variables are involved. Based on the significant correlations between most of the variables in this study, this overlap between scales may have impacted the results.

The sample used for this study consisted of young adult college students, typically from the psychology department, and therefore not necessarily reflective of the general population or a clinical sample. The convenient nature of the sample and the online surveys also allowed for a large sample size, which permitted adequate power to detect small interaction effects. However, with a large sample size it is especially important to consider the magnitude of the effects, rather than simply statistical significance. In this study, most unique effects that were detected were small in size, indicating that the predictors did not explain a large portion of variance in criterion variables. One possible explanation for the small effect sizes lies in the aforementioned strong correlations between variables and the strategy of partialling out the influence of covariates to examine unique effects. For example, partialling out the influence of proactive aggression when investigating reactive aggression makes it possible to look at the unique effects of reactive aggression over and above proactive, but when proactive aggression accounts for a sizeable component of variance in the criterion, it leaves a relatively small proportion that could be accounted for by the predictor of interest. Thus while partialling out covariates allows for a more convincing argument that the effects found are due specifically to the variables of interest, it may also significantly reduce the magnitude of the effects that are detected.

Bearing these limitations in mind, the results of this study may have some interesting implications for the risk of mental disorders. High negative affect and low effortful control are both associated with higher levels of depression, anxiety, and reactive aggression, which indicates that targeting either or both in treatment could reduce such issues. These findings also indicate that effortful control and negative affect would be helpful treatment targets regardless of whether a client is experiencing difficulties with depression, anxiety, or depression individually or co-morbidly. This is particularly encouraging in light of evidence that training can improve self-regulatory ability (e.g., Baumeister, Gailliot, DeWall, & Oaten, 2006). Though this research has not focused on improving effortful control specifically, it could be a valuable area for more study.

Future research should also investigate whether this study's findings hold using different measures for the constructs, including observer reports and laboratory measures. Since it has been noted that behavioral measures of effortful control have typically been found to have little correlation with report measures (Zhou et al., 2011), it could be informative to investigate whether such performance-based measures produce similar results to the self-report measures in this study, ideally by comparing the two methods within the same study. In addition, future studies should consider potential variability in the role of different components of EC by investigating the role of attentional control, activation control, and inhibitory control components of EC. The abundance of research connecting attentional control to internalizing symptoms suggests a relatively strong relationship between the two. On the other hand, the dearth of studies pertaining to inhibitory control in general, and especially for internalizing symptoms, may indicate that inhibitory control plays less of a role in anxiety and depression, although it may be more pertinent to RA. By conducting exploratory analyses with attentional control and inhibitory

control, hopefully a clearer picture of the relationships between these variables will emerge. In addition, future studies should investigate whether the findings hold for more varied community samples or for clinical populations.

In conclusion, while the present study supported the notion of effortful control and negative affect as common mechanisms for depression, anxiety, and reactive aggression in young adults, a more nuanced picture emerged than initially predicted. The interaction of effortful control and negative affect was found to predict depression such that negative affect was positively related to depression at all levels of effortful control, and more strongly so at low levels of effortful control. These factors predicted anxiety and reactive aggression in an additive fashion rather than interactive. This result indicates that the combination of effortful control and negative affect does function as a common mechanism for depression, anxiety, and reactive aggression, only differing slightly in configuration. Future studies should investigate this finding with different populations and with a wider variety of measures to see if it holds under different circumstances.

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Table 1

Descriptive Data and Correlations (n = 921)

	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7	8	9	10
1. Effortful Control	13.02	2.22	.80	—									
2. Negative Affect	16.21	2.67	.90	-.41**	—								
3. Somatic Anxiety	19.74	5.50	.83	-.17**	.13**	—							
4. Total Anxiety	37.28	8.89	.90	-.16**	.11**	.92**	—						
5. Proactive Aggression	1.39	2.34	.86	-.15**	.07*	.14**	.18**	—					
6. Reactive Aggression	6.41	3.67	.83	-.25**	.25**	.25**	.25**	.59**	—				
7. Depression	5.33	4.34	.83	-.36**	.40**	.22**	.22**	.12**	.24**	—			
8. Positive Affect	34.43	7.37	.83	.17**	-.12**	-.14**	-.13**	-.06	-.10**	-.25**	—		
9. Gender	.03	.452	--	.03	-.13**	-.01	.00	.06	.06	-.01	.01	—	
10. Age (years)	20.1	1.74	--	.01	-.01	-.03	-.02	-.05	-.03	.02	-.01	.01	—

Note. Gender was coded female = 0, male = 1; * $p < .05$ (1-tailed), ** $p < .01$ (1-tailed); α = Cronbach's alpha

Table 2.

Regression of Reactive Aggression on Depression, Anxiety, and Effortful Control (Hypothesis 1).

Dependent Variable	Predictors	<i>b</i>	<i>SE b</i>	<i>b*</i>	<i>t</i>	<i>R</i> ² Change
Reactive aggression	Step 1					0.37
	Somatic anxiety	.11	.02	.17	6.45***	
	Gender	.22	.21	.03	1.04	
	Proactive aggression	1.46	.07	.56	21.22***	
	Step 2					0.39
	Effortful control	-.70	.13	-.14	-5.34**	
Reactive aggression	Step 3					0.40
	Depression	.10	.03	.11	3.90**	
Reactive aggression	Step 1					0.35
	Positive affect	-.03	.01	-.07	-2.50*	
	Gender	.20	.21	.03	.96	
	Proactive aggression	1.51	.07	.58	21.73***	
	Step 2					0.37
	Effortful control	-.78	.13	-.16	-5.85***	
Reactive aggression	Step 3					0.39
	Anxiety	.05	.01	.13	4.87***	

Note. Coefficients and *t*-tests are reported at the step in which the variable was entered.

Continuous independent variables are mean centered. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3

Regression of Depression and Anxiety on Negative Affect and Effortful Control, and their Interaction (Hypothesis 2).

Dependent Variable	Predictors	<i>b</i>	<i>SE b</i>	<i>b*</i>	<i>t</i>	<i>R</i> ² Change
Depression	Step 1					0.05
	Somatic anxiety	.16	.02	.22	6.84***	
	Step 2					0.22
	Negative affect	1.81	.20	.30	9.17***	
	Effortful control	-1.14	.18	-.21	-6.36***	
	Gender	.27	.26	.03	1.03	
	Step 3					0.23
EC x NA	-.49	.23	-.06	-2.13*		
NA x Gender	-.18	.40	-.02	-.44		
Anxiety	Step 1					.02
	Positive affect	-.15	.04	-.13	-3.94***	
	Step 2					.04
	Negative affect	.63	.47	.05	1.34	
	Effortful control	-1.48	.43	-.12	-3.47***	
	Gender	.22	.62	.01	.35	
	Step 3					.04
EC x NA	-.45	.54	-.03	-.83		
NA x Gender	-1.40	.96	-.06	-1.46		

Note. Coefficients and *t*-tests are reported at the step in which the variable was entered. EC = effortful control, NA = negative affect. Continuous independent variables are mean centered.

* $p < 0.05$, ** $p < 0.01$. *** $p < 0.001$

Table 4

Regression of Reactive Aggression on Depression, Anxiety, Negative Affect, and Effortful

Control, and the EC x NA Interaction (Hypothesis 3).

Dependent Variable	Predictors	<i>b</i>	<i>SE b</i>	<i>b*</i>	<i>t</i>	<i>R</i> ² Change
Reactive aggression	Step 1					0.37
	Somatic anxiety	.11	.02	.17	21.32***	
	Proactive aggression	1.46	.07	.56	6.43***	
	Step 2					0.42
	Depression	.06	.03	.06	2.22*	
	Negative affect	.86	.16	.16	5.41***	
	Effortful control	-.29	.14	-.06	-2.05*	
	Gender	.40	.20	.05	1.99	
	Step 3					0.42
	EC x NA	-.09	.18	-.01	-.51	
NA x Gender	.06	.31	.01	.202		
Reactive aggression	Step 1					0.35
	Positive affect	-.03	.01	-.07	-2.48*	
	Proactive aggression	1.52	.07	.58	21.83***	
	Step 2					0.41
	Anxiety	.05	.01	.12	4.70***	
	Negative affect	.97	.15	.18	6.34***	
	Effortful control	-.36	.14	-.07	-2.54*	
	Gender	.41	.20	.05	2.04*	
	Step 3					0.41
	EC x NA	-.11	.18	-.02	-.60	
NA x Gender	.05	.31	.01	.16		

Note. Coefficients and *t*-tests are reported at the step in which the variable was entered. EC = effortful control, NA = negative affect. Continuous independent variables are mean centered.

* $p < 0.05$, ** $p < 0.01$. *** $p < 0.001$

Table 5

Regression of Reactive Aggression on Depression, Anxiety, Effortful Control, and their

Interactions (Subsidiary Analysis 1).

Dependent Variable	Predictors	<i>B</i>	<i>SE b</i>	<i>b*</i>	<i>t</i>	<i>R</i> ² Change
Reactive aggression	Step 1					0.37
	Somatic anxiety	.11	.02	.17	21.32***	
	Proactive aggression	1.47	.07	.56	6.43***	
	Step 2					0.42
	Depression	.10	.03	.10	3.90***	
	Effortful control	-.53	.14	-.11	-3.87***	
	Gender	.26	.20	.03	1.28	
	Step 3					0.42
	EC x Depression	.05	.03	.04	1.64	
Depression x Gender	-.02	.305	-.01	-.45		
Reactive aggression	Step 1					0.35
	Positive affect	-.03	.01	-.07	-2.48*	
	Proactive aggression	1.52	.07	.58	21.83***	
	Step 2					0.39
	Anxiety	.05	.01	.12	4.87***	
	Effortful control	-.70	.13	-.07	-5.30*	
	Gender	.25	.21	.05	1.22	
	Step 3					0.39
	EC x Anxiety	-.01	.01	-.02	-.90	
Anxiety x Gender	-.01	.02	.01	-.51		

Note. Coefficients and *t*-tests are reported at the step in which the variable was entered. EC = effortful control. Continuous independent variables are mean centered. * $p < 0.05$, ** $p < 0.01$.

*** $p < 0.001$

Table 6

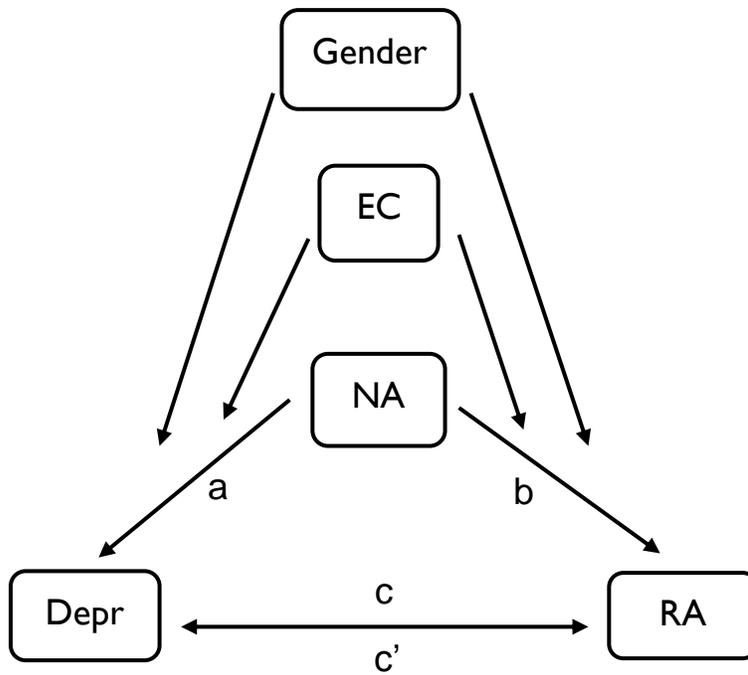
Regression of Reactive Aggression on Depression, Anxiety, Negative Affect, Effortful Control, and their Interactions (Subsidiary Analysis 2).

Dependent Variable	Predictors	<i>B</i>	<i>SE b</i>	<i>b*</i>	<i>t</i>	<i>R</i> ² Change
Reactive aggression	Step 1					0.37
	Somatic anxiety	.11	.02	.17	21.32***	
	Proactive aggression	1.46	.07	.56	6.43***	
	Step 2					0.42
	Depression	.06	.03	.06	2.22*	
	Negative affect	.86	.16	.16	5.41***	
	Effortful control	-.29	.14	-.06	-2.06*	
	Gender	.40	.20	.05	1.99*	
	Step 3					0.42
	EC x NA	-.09	.18	-.01	-.51	
NA x Gender	.06	.31	.01	.20		
Reactive aggression	Step 4					0.42
	EC x Depression	.06	.03	.05	1.66	
	Depression x Gender	-.03	.05	-.02	-.49	
	Step 1					0.35
	Positive affect	-.03	.01	-.07	-2.48*	
	Proactive aggression	1.52	.07	.58	21.83***	
Reactive aggression	Step 2					0.41
	Anxiety	.05	.01	.12	4.70***	
	Negative affect	.97	.15	.18	6.34***	
	Effortful control	-.36	.14	-.07	-2.54*	
	Gender	.41	.20	.05	2.04*	
	Step 3					0.41
EC x NA	-.11	.18	-.02	-.60		
NA x Gender	.05	.31	.01	.16		
Reactive aggression	Step 4					0.41
	EC x Anxiety	-.01	.02	-.02	-.58	
	Anxiety x Gender	-.01	.02	-.01	-.29	

Note. Coefficients and *t*-tests are reported at the step in which the variable was entered. EC = effortful control, NA = negative affect. Continuous independent variables are mean centered.

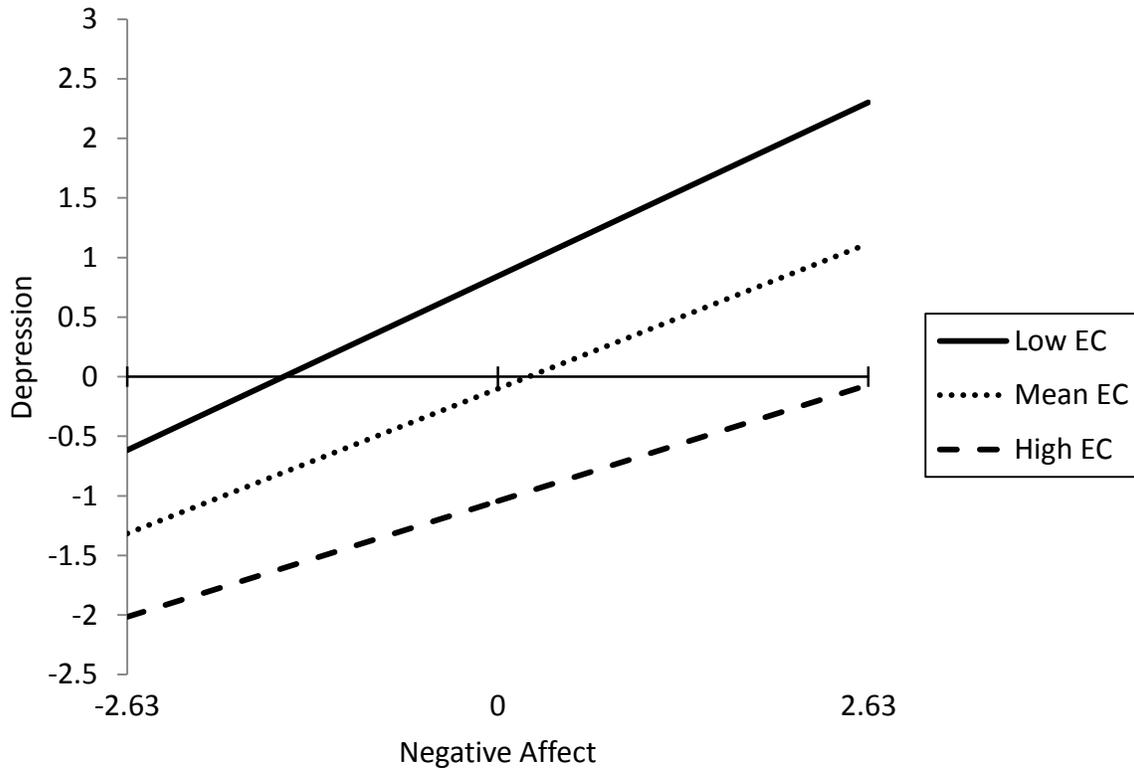
* $p < 0.05$, ** $p < 0.01$. *** $p < 0.001$

Figure 1. Proposed common mechanism model.



Note: EC = effortful control, NA = negative affect, Depr = depression, RA = Reactive Aggression. c = total effect of depression on effortful control, and c' = direct effect when NA, EC, and gender are added to the model.

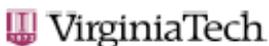
Figure 2. Negative affect on depression at three levels of effortful control.



Note: Centered scores were used to graph the interaction. Low EC = 1 SD below sample mean EC, high EC = 1 SD above sample mean EC. The values on the x-axis represent the mean, one standard deviation below the mean, and one standard deviation above the mean for negative affect.

Appendix A

IRB Approval Letter



Office of Research Compliance
Institutional Review Board
2000 Kraft Drive, Suite 2000 (0407)
Blacksburg, Virginia 24060
540/231-4606 Fax 540/231-0959
e-mail: irb@vt.edu
Website: www.irb.vt.edu

MEMORANDUM

DATE: March 8, 2012

TO: Bradley White, Karin Turner

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires May 31, 2014)

PROTOCOL TITLE: Adult Personal Experiences Survey

IRB NUMBER: 10-210

Effective March 8, 2012, the Virginia Tech IRB Administrator, Carmen T. Green, approved the amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

PROTOCOL INFORMATION:

Approved as: Expedited, under 45 CFR 46.110 category(ies) 7

Protocol Approval Date: 3/22/2011 (protocol's initial approval date: 3/22/2010)

Protocol Expiration Date: 3/20/2012

Continuing Review Due Date*: 3/7/2013

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
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Date*	OSP Number	Sponsor	Grant Comparison Conducted?

*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

cc: File
Department Reviewer:David W. Harrison

IRB Approved Implied Consent Information Sheet

ADULT PERSONAL EXPERIENCES SURVEY

Purpose

The purpose of this study is to assess relationships between a variety of emotions, experiences, and ways of responding in young adults. Based on the results of this study, we hope to contribute to basic knowledge in the field of psychology that might also lead to better services for certain difficulties commonly experienced by this age group. Note: This study is for research purposes only. Your responses will be combined with those of other individuals to help answer important questions in the field of psychology. You will be asked if you have experienced common symptoms of a variety of mental and physical health conditions, but you will not receive any feedback on your responses or performance, such as an assessment, diagnosis, treatment, or other clinical services. The potential risks and benefits to you as a participant are explained further below.

Procedures

Phase I of the study involves a 3-part online survey that is open to anyone age 18 years and older. Each part of the survey takes approximately 45 minutes. You must complete one part before you will be provided by email with the URL for the next part. Compensation for each part is described below. After reading this information page, if you wish to continue with Part 1 of the survey, you will enter your email address on the next page. Your email will be used for several purposes, to: (1) assign your data to an ID number for confidentiality purposes, (2) contact you with the URL for the next part of the survey, (3) contact you to invite you to participate in Phase II if you qualify, and (4) notify you if you win the raffle (see below).

Phase II of the study is by invitation only. It involves a paid in-lab session on the VT campus for additional credit for some individuals who are already in Phase I. Further details will be provided if you are invited to participate.

Risks and Benefits

The first risk is that the three-part survey takes time and attention that you could put toward other activities. A second risk regards the types of questions asked in the survey. All items have been very carefully selected, yet you may find some of them to seem boring or repetitive, and some may seem sensitive or quite personal. They could lead you to feel uncomfortable or bring up unpleasant memories. Please remember that you are free to withdraw from the study at any time. But if you agree to participate, we ask that you do so at a time that you can work by yourself and focus on the survey, reading all instructions and items carefully, and responding in a totally honest manner. At the end of the survey, we provide a list of several services on campus and in the community that are available if you would like to talk with someone. (Please note that some services are free while others are at a cost, and that you would be responsible for any costs for services you seek.) Beyond the compensation described below, there is likely no direct benefit to you for completing this survey. However, we hope that results of this study can ultimately improve the quality and types of services provided for a variety of difficulties that young adults sometimes face.

Compensation

For those participating for psychology course credit (Sona), you will receive 1, 2, or 3 credits, depending upon how many parts of the 3-part survey you complete. You will also be automatically entered into a raffle to win a \$30 check as described below if you complete all 3 parts. Apart from the raffle, there is no monetary compensation for this Phase of the study, only Sona credits for those in participating psychology department courses using the Sona System. Please speak with your course instructor if you have questions about how Sona credit will affect your grade or about alternative ways to earn extra credit.

To earn Sona credit: You must sign up for the study in Sona (<https://vt-psyc.sona-systems.com/>). You can access the first part of the survey through a link in Sona or by entering the URL by hand. The survey is hosted on a secure website by SurveyMonkey.com. You will be asked to enter the email address linked to your Sona account, which is required in order for us to give you credit in Sona. You will earn one credit each time you do one part of the survey. Sona credit will be updated within about a week of your participation. You may withdraw from the survey at any time. However, each time you complete a part of the survey, the experimenter will send you an invitation code that will allow you to sign up in Sona for the next part of the survey and earn another credit (up to 3 credits).

To enter Raffle: After completing the third part of the survey, you will be automatically entered into a raffle in which you may win a check for \$30.00 (approximate odds of winning are 1 in 25). Even if you don't complete a three parts of the survey, you will still earn one credit in the Sona system for each part of the survey that you do undertake.

Confidentiality

The only personally identifying information we request is your email address. All of your answers will be kept strictly confidential. Your individual responses and email address will not be released to anyone outside of the investigator's lab. The only case in which it would be shared is with your permission or as required by U.S. or State law. You are welcome to contact the investigator at any time with any questions or concerns. My contact information is listed below.

You do not have to participate in this survey. If you choose to do so, you can stop participating in this study at any time without penalty; credit will be prorated for the parts undertaken. If you choose to participate, keep in mind that there are no "right" or "wrong" answers. Please just read the instructions and questions carefully and answer every question honestly.

Questions/Contact Information

If you would like to speak with the investigator or other member of the research team, please call Dr. White at the Cognition Emotion and Self-Regulation (CEaSR) Lab at (540) 231-1382 or email us at: vt.psydstudy@gmail.com

If you have any questions about the protection of human research participants regarding this study, you may contact David W. Harrison, Ph.D., Chair, Human Subjects Committee, Psychology Department, telephone: (540) 231-4433; email: dwh@vt.edu; address: Department of Psychology, Virginia Tech, 109 Williams Hall (0436), Blacksburg, VA 24061.

You may also contact Dr. David Moore, Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects, telephone: (540) 231-4991; email: moored@vt.edu; address: Office of Research Compliance, 2000 Kraft Drive, Suite 2000 (0497), Blacksburg, VA 24060.

**Entering your email on the next page will indicate that you consent to participate in this study.
We appreciate your input and thank you for your time and assistance!**

Appendix B

Patient Health Questionnaire

(PHQ; Spitzer, Kroenke, & Williams, 1999)

Below are the questions from the PHQ used to operationalize depression:

2. Over the <u>last 2 weeks</u> , how often have you been bothered by any of the following problems?	More Nearly			
	Not at all	Several days	than half the days	every day
a. Little interest or pleasure in doing things.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Feeling down, depressed, or hopeless.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Trouble falling or staying asleep, or sleeping too much.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Feeling tired or having little energy.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Poor appetite or overeating.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Feeling bad about yourself — or that you are a failure or have let yourself or your family down.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Trouble concentrating on things, such as reading the newspaper or watching television.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Thoughts that you would be better off dead or of hurting yourself in some way.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix C

State-Trait Inventory for Cognitive and Somatic Anxiety

(STICSA; Ree, French, MacLeod, & Locke, 2008)

Instructions: Please read each statement carefully and select the number which best indicates how often, in general, the statement is true for you (1 = almost never, 2 = occasionally, 3 = often, 4 = almost always).

-
1. My heart beats fast.
 2. My muscles are tense.
 3. I feel agonized over my problems.
 4. I think that others won't approve of me.
 5. I feel like I'm missing out on things because I can't make up my mind soon enough.
 6. I feel dizzy.
 7. My muscles feel weak.
 8. I feel trembly and shaky.
 9. I picture some future misfortune.
 10. I can't get some thought out of my mind.
 11. I have trouble remembering things.
 12. My face feels hot.
 13. I think that the worst will happen.
 14. My arms and legs feel stiff.
 15. My throat feels dry.
 16. I keep busy to avoid uncomfortable thoughts.
 17. I cannot concentrate without irrelevant thoughts intruding.
 18. My breathing is fast and shallow.
 19. I worry that I cannot control my thoughts as well as I would like to.
 20. I have butterflies in the stomach.
 21. My palms feel clammy.
-

Appendix D

Positive and Negative Affect Schedule

(PANAS; Watson, Clark, & Tellegen; 1988)

Instructions: This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way in general, that is, on the average. Use the following scale to record your answers:

	Slightly/Not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Appendix E

Adult Temperament Questionnaire

(ATQ; Rothbart, Ahadi, & Evans, 2000)

Directions: For each item below, please read each statement carefully, then select the number below that best indicates how well the statement describes you.

1	2	3	4	5	6	7	X
extremely untrue	quite untrue	slightly untrue	neither true nor false	slightly true	quite true	extremely true	not applicable

1. I become easily frightened.
2. I am often late for appointments.
3. Sometimes minor events cause me to feel intense happiness.
4. I find loud noises to be very irritating.
5. It's often hard for me to alternate between two different tasks.
6. I rarely become annoyed when I have to wait in a slow moving line.
7. I would not enjoy the sensation of listening to loud music with a laser light show.
8. I often make plans that I do not follow through with.
9. I rarely feel sad after saying goodbye to friends or relatives.
10. Barely noticeable visual details rarely catch my attention.
11. Even when I feel energized, I can usually sit still without much trouble if it's necessary.
12. Looking down at the ground from an extremely high place would make me feel uneasy.
13. When I am listening to music, I am usually aware of subtle emotional tones.
14. I would not enjoy a job that involves socializing with the public.
15. I can keep performing a task even when I would rather not do it.

16. I sometimes seem to be unable to feel pleasure from events and activities that I should enjoy.
17. I find it very annoying when a store does not stock an item that I wish to buy.
18. I tend to notice emotional aspects of paintings and pictures.
19. I usually like to talk a lot.
20. I seldom become sad when I watch a sad movie.
21. I'm often aware of the sounds of birds in my vicinity.
22. When I am enclosed in small places such as an elevator, I feel uneasy.
23. When listening to music, I usually like turn up the volume more than other people.
24. I sometimes seem to understand things intuitively.
25. Sometimes minor events cause me to feel intense sadness.
26. It is easy for me to hold back my laughter in a situation when laughter wouldn't be appropriate.
27. I can make myself work on a difficult task even when I don't feel like trying.
28. I rarely ever have days where I don't at least experience brief moments of intense happiness.
29. When I am trying to focus my attention, I am easily distracted.
30. I would probably enjoy playing a challenging and fast paced video-game that makes lots of noise and has lots of flashing, bright lights.
31. Whenever I have to sit and wait for something (e.g., a waiting room), I become agitated.
32. I'm often bothered by light that is too bright.
33. I rarely notice the color of people's eyes.
34. I seldom become sad when I hear of an unhappy event.
35. When interrupted or distracted, I usually can easily shift my attention back to whatever I was doing before.
36. I find certain scratchy sounds very irritating.

37. I like conversations that include several people.
38. I am usually a patient person.
39. When I am resting with my eyes closed, I sometimes see visual images.
40. It is very hard for me to focus my attention when I am distressed.
41. Sometimes my mind is full of a diverse array of loosely connected thoughts and images.
42. Very bright colors sometimes bother me.
43. I can easily resist talking out of turn, even when I'm excited and want to express an idea.
44. I would probably not enjoy a fast, wild carnival ride.
45. I sometimes feel sad for longer than an hour.
46. I rarely enjoy socializing with large groups of people.
47. If I think of something that needs to be done, I usually get right to work on it.
48. It doesn't take very much to make feel frustrated or irritated.
49. It doesn't take much to evoke a happy response in me.
50. When I am happy and excited about an upcoming event, I have a hard time focusing my attention on tasks that require concentration.
51. Sometimes, I feel a sense of panic or terror for no apparent reason.
52. I often notice mild odors and fragrances.
53. I often have trouble resisting my cravings for food drink, etc.
54. Colorful flashing lights bother me.
55. I usually finish doing things before they are actually due (for example, paying bills, finishing homework, etc.).
56. I often feel sad.
57. I am often aware how the color and lighting of a room affects my mood.
58. I usually remain calm without getting frustrated when things are not going smoothly for me.
59. Loud music is unpleasant to me.

60. When I'm excited about something, it's usually hard for me to resist jumping right into it before I've considered the possible consequences.
61. Loud noises sometimes scare me.
62. I sometimes dream of vivid, detailed settings that are unlike anything that I have experienced when awake.
63. When I see an attractive item in a store, it's usually very hard for me to resist buying it.
64. I would enjoy watching a laser show with lots of bright, colorful flashing lights.
65. When I hear of an unhappy event, I immediately feel sad.
66. When I watch a movie, I usually don't notice how the setting is used to convey the mood of the characters.
67. I usually like to spend my free time with people.
68. It does not frighten me if I think that I am alone and suddenly discover someone close by.
69. I am often consciously aware of how the weather seems to affect my mood.
70. It takes a lot to make me feel truly happy.
71. I am rarely aware of the texture of things that I hold.
72. When I am afraid of how a situation might turn out, I usually avoid dealing with it.
73. I especially enjoy conversations where I am able to say things without thinking first.
74. Without applying effort, creative ideas sometimes present themselves to me.
75. When I try something new, I am rarely concerned about the possibility of failing.
76. It is easy for me to inhibit fun behavior that would be inappropriate.
77. I would not enjoy the feeling that comes from yelling as loud as I can.

[Below are the additional Effortful Control items from ATQ Long Form.]

1. If I want to, it is usually easy for me to keep a secret.
2. As soon as I have decided upon a difficult plan of action, I begin to carry it out.
3. When I am sad about something, it is hard for me to keep my attention focused on a task.
4. When I decide to quit a habitual behavioral pattern that I believe to be undesirable, I am usually successful.
5. Even when I have enough time to complete an activity today, I often tell myself that I will do it tomorrow.
6. When I am anxious about the outcome of something, I have a hard time keeping my attention focused on a task.
7. I often avoid taking care of my responsibilities by indulging in pleasurable activities.
8. If I notice I need to clean or wash something (e.g., car, apartment, laundry, etc.), I often put it off until tomorrow.
9. When I am especially happy, I sometimes have a hard time concentrating on tasks that require me to keep track of several things at once.
10. At times, it seems the more I try to restrain a pleasurable impulse (e.g., eating candy), the more likely I am to act on it.
11. I hardly ever finish things on time.
12. When I hear good news, my ability to concentrate on taking care of my responsibilities goes out the window.
13. I usually get my responsibilities taken care of as soon as possible.
14. When trying to focus my attention on something, I have difficulty blocking out distracting thoughts.
15. When trying to study something, I have difficulty tuning out background noise and concentrating.
16. I am usually pretty good at keeping track of several things that are happening around me.

Appendix F

Reactive Proactive Aggression Questionnaire

(RPQ; Raine et al., 2006)

Instructions: There are times when most of us feel angry, or have done things we should not have done. Rate each of the items below by putting a circle around 0 (never), 1 (sometimes), or 2 (often). Do not spend a lot of time thinking about the items—just give your first response. Make sure you answer all the items (see below).

0=never 1= sometimes 2 =often

How often have you...

- | | |
|---|-------|
| 1. Yelled at others when they have annoyed you | 0 1 2 |
| 2. Had fights with others to show who was on top | 0 1 2 |
| 3. Reacted angrily when provoked by others | 0 1 2 |
| 4. Taken things from other students | 0 1 2 |
| 5. Gotten angry when frustrated | 0 1 2 |
| 6. Vandalized something for fun | 0 1 2 |
| 7. Had temper tantrums | 0 1 2 |
| 8. Damaged things because you felt mad | 0 1 2 |
| 9. Had a gang fight to be cool | 0 1 2 |
| 10. Hurt others to win a game | 0 1 2 |
| 11. Become angry or mad when you don't get your way | 0 1 2 |
| 12. Used physical force to get others to do what you want | 0 1 2 |
| 13. Gotten angry or mad when you lost a game | 0 1 2 |
| 14. Gotten angry when others threatened you | 0 1 2 |
| 15. Used force to obtain money or things from others | 0 1 2 |
| 16. Felt better after hitting or yelling at someone | 0 1 2 |
| 17. Threatened and bullied someone | 0 1 2 |

18. Made obscene phone calls for fun	0 1 2
19. Hit others to defend yourself	0 1 2
20. Gotten others to gang up on someone else	0 1 2
21. Carried a weapon to use in a fight	0 1 2
22. Gotten angry or mad or hit others when teased	0 1 2
23. Yelled at others so they would do things for you	0 1 2