

FAILURE TO LAUNCH: ATTACHMENT STYLES CAN PROMOTE SELF-REGULATORY ORIENTATIONS THAT RESULT IN PROCRASTINATION

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An individual's attachment style affects many interdependent and independent outcomes in their life. Attachment styles exist along two dimensions; avoidant and anxious. The current study explored the relationship between attachment style, independent self-regulatory preferences, and achievement. Regulatory mode preferences similarly exist along two dimensions; locomotion and assessment. Specifically, the relationship between attachment styles (avoidant and anxious), regulatory mode preferences (locomotion and assessment), trait and behavioral procrastination, and student achievement was examined. Students (N=201) at the University of Pittsburgh completed self-report measures of attachment style, regulatory mode preference, and trait procrastination. Behavioral procrastination was measured by recording the number of minutes before or after the assignment deadline that the student electronically submitted their assignment. Grades on these assignments were also recorded. Two mediational models were found to be significant for these variables. First, high avoidant attachment scores predicted low locomotion scores, which predicted high trait procrastination scores, which predicted high behavioral procrastination scores, which finally predicted lower grades. Second, high anxious attachment scores predicted high assessment scores, which predicted high trait procrastination scores, which

predicted high behavioral procrastination scores, which finally predicted lower grades. Implications for attachment theory, regulatory mode theory, and student procrastination behaviors are discussed.

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1.0 INTRODUCTION

As Victor Kiam famously said, “Procrastination is opportunity's assassin.” Every day represents a new opportunity for achievement, and every day individuals engage and interact with their environment in order to attain their goals. Goals are defined as desired end-states which are both perceived as attainable and motivate a person to take steps to achieve them (Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002). It is this very definition that makes procrastination perplexing. Procrastination is defined as delaying or avoiding engaging in goal pursuit when such delay is not strategic and is expected to harm eventual achievement (Steel, 2007). In certain cases it may be perfectly rational to delay immediate goal pursuit, such as instances when delay will allow for additional information gathering that will ultimately increase the likelihood of success. Procrastination, however, is specifically defined as a circumstance in which the path to goal pursuit is clear and delay knowingly decreases the likelihood of success. In this way, procrastination can be viewed as the antithesis of successful goal pursuit.

Procrastination is rampant among university students. It is estimated that 50% of university students regularly engage in procrastination, with 32% of them identified as severe procrastinators (Day, Mensink, & O’Sullivan, 2000). Procrastination at the university level is problematic because it is associated with heightened stress, lower grades, and decreased health for those who procrastinate compared to those who do not (Tice & Baumeister, 1997). Specifically, in study one, students who scored highly on Lay’s (1986) General Procrastination

scale turned in their term papers significantly later than students who had a low score of procrastination ($r = .45$). Furthermore, procrastinators received significantly lower grades on both their term papers ($r = -.29$) and their exams ($r = -.64$) compared to non-procrastinators. These findings were replicated in a second study, with the additional findings that procrastinators reported significantly more negative health symptoms ($r = .65$), more visits to health care professionals ($r = .37$), and more stress ($r = .68$) during the last week of the semester compared to non-procrastinators. Given the pervasive and detrimental nature of procrastination, it is important to understand the underlying cause(s) of procrastination.

Whereas procrastination is a failure due to lack of engaging in the steps necessary to achieve one's goal, the nature of this failure is different from that of someone who is apathetic towards goal pursuit. In cases where there is no particular goal and therefore no motivation to achieve it, it is perfectly rational to avoid spending the time and energy required to pursue that end. However, in the case of true procrastination the end is desired and the steps for achievement are known. What, then, would cause procrastination? Rather than conceptualize procrastination as a complete absence of goal pursuit, it is potentially more fruitful to conceive of it as a consequence of goal pursuit styles or orientations that tend to result in a failure to launch into action.

The aim of the current study is to understand this failure to launch. Specifically, the relationship between procrastination and two specific self-regulatory orientations will be explored. Attachment theory and Regulatory Mode theory describe self-regulatory orientations, and these two theories have been empirically linked to each other in recent studies that will be discussed below. Furthermore, regulatory modes have previously been shown to affect procrastination behaviors. Therefore, this study examines self-regulatory modes and attachment

styles as these orientations relate to goal pursuit generally and procrastination specifically. A mediation model is proposed to investigate the way in which these orientations promote procrastination behavior. An observational study in which attachment styles, regulatory modes, and procrastination behavior are measured in an academic setting was utilized to test this model.

1.1 ATTACHMENT THEORY

Bowlby (1960; 1969; 1973) developed attachment theory to describe the types of relationships that develop between individuals and caretakers during childhood. He posited that humans have an innate “attachment system” that drives them to form close bonds with others who act as caregivers. This attachment system becomes active in times of distress. Individuals learn from their interactions with caretakers and create cognitive frameworks that assist in predicting how future endeavors in care-seeking may succeed or fail. This framework constitutes a working model of how the individual should respond to situations, either through independent exploration or by reaching for assistance, and a model of how the individual may expect other people in their environment to respond to the individual’s needs for independence or care. These working models become behavioral patterns that extend into other future relationships and endeavors.

Bowlby (1969) termed the desire to turn to close others for comfort and care the “safe haven” aspect of attachment style. When distressed, a child is motivated to seek a close caregiver to be comforted. The (un)availability of the caregiver at this time indicates to the child whether and to what extent they can be sure of receiving this particular type of care in the future. Exploring the environment and pursuing goals opens an individual up to potential distress. Knowing that one can be confident in receiving care if distress occurs provides one with a sense

of having a secure base serving as “back-up” to which one can return to if distress is experienced. Having this secure base allows the child to feel more confident in their explorations and goal pursuit behaviors. Therefore, the existence of a healthy secure base encourages independent exploration of the environment and goal pursuit.

These attachment styles have been found to perpetuate into adult relationships (Ainsworth, 1991; Brennan, Clark, & Shaver, 1998; Fraley, & Shaver, 2000). Research examining adult attachment has found that attachment styles are characterized by two dimensions of avoidance and anxiety, wherein secure attachment is reflected by the relative absence of both avoidance and anxiety tendencies (Brennan, Clark, & Shaver, 1998; Fraley & Shaver, 2000; Fraley, Waller, & Brennan, 2000). In a supportive environment individuals develop a secure attachment style (non-avoidant and non-anxious). An individual with a secure attachment style understands their relationship as both a safe haven and a secure base. This promotes an appropriate level of interdependence and independence by which an individual feels secure enough to turn to others for care in times of need and to explore the environment in pursuit of independent goals. In a consistently neglectful relationship, s/he develops an avoidant attachment style. This individual does not feel as though s/he has a safe haven or secure base. In this case, the individual rejects seeking support from caretakers and behaves in an overly independent manner. S/h detaches and disengages such that s/he avoids situations in which his/her needs may fail to be met. When an individual experiences an inconsistently available partner where support is sometimes provided but other times withheld she develops an anxious attachment style. This individual also does not feel as though they have a safe haven or secure base. In this particular case, the individual reacts by reaching for support while simultaneously fearing it to be unavailable. She becomes overly vigilant for and hyper-sensitive to cues which

could indicate the availability or unavailability of support. The consequences of these different attachment styles have been well established across a number of both interpersonal and intrapersonal functions in the decades since the theory was first proposed (Cassidy, & Shaver, 2008).

Anxious attachment is associated with increased distress when a partner is away (Fraley & Shaver, 1998), greater accessibility of thoughts surrounding the potential of a partner leaving (Fraley & Shaver, 1997), increased care-seeking behaviors (Collins & Feeney, 2000) but also increased stress when in the presence of a partner during a stressful situation (Rholes, Simpson, & Orina, 1999; Simpson, Rholes, & Nelligan, 1992; Simpson, Rholes, Orina, & Grich, 2002), as well as increased stress when a conflict with the partner is discussed (Campbell, Simpson, Boldry, & Kashy, 2005; Simpson, Rholes, & Phillips, 1996). These effects occur due to anxiously attached individuals' hyperactivation of the attachment system, which places the individual in a state of extreme alert and sensitivity.

On the other hand, while these same studies show a negative relationship between avoidant attachment and these stress responses, those with avoidant attachment also fail to engage in care-seeking behaviors (Collins & Feeney, 2000). This is due to avoidantly attached individuals' ability to partially, if not completely, suppress the attachment system. Even though the attachment system may be repressed by avoidantly attached individuals, the attachment needs do not disappear. Instead, they are ignored to the detriment of the avoidantly attached individual. While the stresses associated with anxious attachment are avoided, the neglect of attachment needs leaves the individual prone to loneliness and lowered self-esteem (Hazan & Shaver, 1990), as well as increased neuroticism (especially the depression subfacet of neuroticism) as described by the Big Five personality scale (Shaver & Brennan, 1992). Furthermore, only the secure (non-

anxious and non-avoidant) attachment style is predictive of stable positive self-regard (Mikulincer, Orbach, & Iavnieli, 1998), increased well-being (Mikulincer & Shaver, 2007), and goal pursuit in the context of the support a partner provides (Feeney, 2004).

1.2 SELF-REGULATORY MODE THEORY

While attachment style describes a general approach one takes to interacting with other people and the environment independently, it does not describe the specific mechanisms through which individuals engage in independent self-regulation and goal pursuit. A potentially fruitful avenue for exploring how attachment style translates into regulatory behavior and goal pursuit is the theory of regulatory mode. There is both theoretical and empirical reason to believe that attachment styles would influence regulatory mode preferences. Previous research has shown that the tendencies developed in early attachment relationships extend their influence into later relationships (Ainsworth, 1991; Brennan, Clark, & Shaver, 1998; Fraley, & Shaver, 2000) and affect individual functioning and self-regulation (Mikulincer et al., 1998; Mikulincer & Shaver, 2007; Orehek, Vazeou-Nieuwenhuis, & Quick, 2014). Given that attachment styles can be characterized as a general approach to interpersonal and individual goal pursuit, attachment styles should also affect the specific individual self-regulatory preferences characterized by regulatory modes. Ongoing research does in fact suggest that there is a relationship between an individual's attachment style and their preferred regulatory mode. Regulatory mode theory is described below, followed by evidence for the relationship between one's attachment style and regulatory mode.

Regulatory mode encompasses how an individual prefers to engage in self-regulation in regard to goal pursuit. It is comprised of two independent dimensions that relate to different motivations and behaviors (Kruglanski, Thompson, Higgins, Atash, Pierro, Shah, & Spiegel, 2000). These dimensions are locomotion and assessment, and individuals may be either high or low on either or both dimensions. Locomotion centers on the desire to feel as though progress is being made towards a goal and focuses on behaviors that enhance this feeling (e.g., actually engaging in the things necessary to move forward towards a goal). High locomotors are characterized by the desire to swiftly engage in tasks and quickly move from one goal to the next. Assessment encompasses a preference for critical thinking and the appraisal of options to find the best course by which to achieve a goal. High assessors are characterized by the time they spend gathering and analyzing goal-relevant information.

Both locomotion and assessment are needed for successful self-regulation. Assessment sets one up to pursue a goal in the best manner possible while locomotion actually makes the moves needed for progress. However, being especially high or low on either dimension can potentially lead to negative consequences. High locomotors can end up moving too quickly from task to task such that jobs are started before appropriate preparations are made. Low locomotors may simply fail to engage in tasks at a sufficient level. High assessors can find themselves needlessly delaying goal progress by awaiting ever more information and overthinking inconsequential details about the task without actually doing anything to move forward on the goal. Low assessors may fail to find the appropriate information that would effectively lead to goal attainment (Kruglanski, Orehek, Higgins, Pierro, & Shalev, 2009).

Regulatory mode preferences have been associated with a number of both individual and interpersonal functions and outcomes. Assessors prefer tasks that involve gathering information

(Klem, Higgins, & Kruglanski, 1996), critically analyzing and appraising it (Taylor & Higgins, 2000), and carefully searching for errors and inconsistencies that may compromise it (Kruglanski et al., 2000; Pierro, Orehek, & Kruglanski, 2009). High locomotion is associated with a preference to start tasks promptly (Klem et al., 1996), move through them quickly (Kruglanski et al., 2000), deactivate thoughts about the current task once sufficient progress has been made (Fitzsimons, Friesen, Orehek, & Kruglanski, 2009), and move on to a new task once enough progress has been made on the original task (Kruglanski, Pierro, Higgins, & Capozza, 2007).

High assessors' inclinations to critically analyze, compare, and evaluate information apply equally to their independent and interpersonal pursuits. As such, assessors tend to experience more self-consciousness (Higgins, Kruglanski, & Pierro, 2003), are more sensitive to criticism (Kruglanski et al., 2000), experience more anxiety in social contexts (Kruglanski et al., 2009), have lower self-esteem (Bornovalova, Fishman, Strong, Kruglanski, & Lejuez, 2008), and experience more distress (Hong, Tan, & Chang, 2004). Conversely, those same studies found that high locomotion is negatively related to the aforementioned factors- high locomotors are more resilient in the face of criticism, have higher self-esteem, and experience less anxiety and distress.

1.3 INTEGRATING ATTACHMENT THEORY AND SELF-REGULATORY MODE THEORY

Given the impact that both attachment styles and regulatory mode preferences have been shown to have on a broad array of interpersonal and individual outcomes, it is important to understand whether and how one might cause or affect the other. The relationship between attachment style

and regulatory mode has been previously examined by Orehek, Vazeou-Nieuwenhuis, and Quick (2014). Again, because the tendencies associated with attachment styles have been shown to affect relationships beyond the original infant-caregiver relationship and have further been shown to affect individual functioning and self-regulation, it is reasonable to expect that these tendencies will affect the specific self-regulatory preferences described by regulatory mode theory. Logically, a person with an avoidant attachment style who disengages would likely have decreased locomotion. The detachment and failure to engage in care-seeking and independent exploration characterized by avoidant attachment could appear in other pursuits as a failure to engage in tasks and goals, which would be characterized as low locomotion. Similarly, a person with an anxious attachment style would likely develop high assessment tendencies. Specifically, the higher vigilance and tendency to appraise, evaluate, and ruminate (Saffrey & Ehrenberg, 2007) that are characteristic of anxious attachment would, if observed in goal pursuit contexts, be indicative of high assessment tendencies.

Three pilot studies examined the relationship between attachment style and regulatory mode (Orehek, Vazeou-Nieuwenhuis, & Quick 2014). The first study measured attachment style with the scale developed by Fraley, Waller, and Brennan (2000) and measured regulatory mode using the scale developed by Kruglanski and colleagues (2000). It was found that avoidant attachment predicted low locomotion while anxious attachment predicted high assessment. There was no significant relationship between avoidant attachment and assessment or anxious attachment and locomotion.

The second study manipulated attachment style and measured regulatory mode. Avoidant attachment was manipulated via a prompt asking participants to either recall a time in which they “were somewhat uncomfortable being close to others;” “found it difficult to trust others

completely and to allow yourself to depend on them;” and “were nervous when anyone got too close, and friends wanted to be closer to you than you felt comfortable with.” Anxious attachment was manipulated via a prompt asking participants to either recall a time in which they “found that others didn’t get as close to you as you would like;” “worried that your friends didn’t really like you or that they would not stay friends with you for long;” and “liked to spend a whole lot of your time with other people, and that this scared them away.” A manipulation check confirmed the success of these prompts in eliciting the target attachment style. The same pattern was found in the second study as was found in the first- participants in the avoidant attachment condition reported lower locomotion and participants in the anxious attachment condition reported higher assessment compared to the secure attachment condition; no other significant effects were found.

Finally, given the previous two studies’ findings connecting attachment style and regulatory mode, their third study examined whether regulatory mode would mediate the relationship between attachment style and a number of self-regulatory and interpersonal variables that have been previously shown to be predicted by attachment style and regulatory mode. Attachment style, regulatory mode, and the dependent variables were all measured using self-report scales. While regulatory mode was found to mediate the relationship between attachment style and a number of variables, the most relevant outcome to the proposed study is the finding regarding perseverance. Low locomotion mediated the relationship between avoidant attachment and low perseverance. Also, high assessment mediated the relationship between anxious attachment and low perseverance. The relationship between perseverance and procrastination is discussed below.

1.4 PREDICTING PROCRASTINATION

The findings regarding perseverance are informative when attempting to predict a relationship between attachment style, regulatory mode, and procrastination. Perseverance is considered to be a facet of conscientiousness (as described by the Big Five personality inventory) and is positively correlated with conscientiousness ($r = .68$) (MacCann, Duckworth, & Roberts, 2009). According to Steel's (2007) meta-analysis, conscientiousness is negatively related to procrastination ($r = -.62$). Furthermore, a study conducted by Dewitte and Schouwenburg (2002) found that perseverance was not only negatively correlated with procrastination ($r = -.72$), but also significantly mediated the relationship between conscientiousness and procrastination such that perseverance accounted for more than half of the correlation between conscientiousness and procrastination. Therefore, given that both avoidant attachment mediated through low locomotion and anxious attachment mediated through high assessment predict low perseverance, and low perseverance predicts higher procrastination, I expect that avoidant attachment mediated through low locomotion and anxious attachment mediated through high assessment will predict procrastination.

More directly, support for the relationship between regulatory mode and procrastination has been established in a series of studies by Pierro, Giacomantonio, Pica, Kruglanski, and Higgins (2011). They predicted that procrastination would be positively correlated with high assessment and negatively correlated with high locomotion. Assessment could increase procrastination due to the tendency to engage in time-consuming analysis and evaluation of the options and methods available for goal achievement. Locomotion should decrease procrastination through its preference to engage in tasks quickly and stick with them.

In the first study, regulatory mode was measured using the scale developed by Kruglanski and colleagues (2000) and procrastination was measured using Tuckman's (1991) 16-item trait procrastination scale. The Tuckman scale presents participants with statements such as "When I have a deadline, I wait till the last minute" which are then rated on a Likert scale. Their analysis found that high locomotion was significantly and negatively related to trait procrastination while high assessment was significantly and positively related to trait procrastination. In the second study, procrastination was measured behaviorally. Students who had indicated their intention to take an exam at the first available date also completed the measure of regulatory mode. Six months later on the date of the exam, the researchers recorded whether or not the student actually took the exam that day or instead postponed taking the exam until a later date. Once again, analyses showed that procrastination on the exam was significantly positively related to assessment and negatively related to locomotion. Finally, this relationship was explored in an occupational setting. Employees completed the regulatory mode questionnaire and listed two goals they would work to achieve in the following three months. At the follow up period participants self-reported the extent to which they felt their work goals had been postponed or delayed. Again, analysis found that procrastination had a significant positive relationship to assessment and a negative relationship to locomotion.

1.5 PRESENT RESEARCH

In summary, there is both a theoretical and empirical link between attachment styles and regulatory mode preferences. Furthermore, research has linked regulatory mode preferences to procrastination. The tendency to disengage, which characterizes avoidant attachment, could

generalize into a tendency to disengage from other goal pursuit and this would represent low locomotion tendencies. The inclination to appraise and evaluate that characterizes anxious attachment could generalize into a preference to critically compare and evaluate factors in the environment regardless of the specific domain, which would characterize high assessment tendencies. The findings of Orehek, Vazeou-Nieuwenhuis, and Quick (2014) support this premise. In addition, there is a logical link between having a self-regulatory preference defined by the desire to experience progress in goal pursuit (e.g. locomotion) and not engaging in procrastination. Furthermore, a self-regulatory preference to critically analyze and evaluate one's options (e.g. assessment) could lead one to delay engaging in direct goal pursuit. Supporting this premise, the negative relationship between locomotion and procrastination and the positive relationship between assessment and procrastination has been established empirically by Pierro and colleagues (2011).

However, while the link between attachment style and regulatory mode and the link between regulatory mode and procrastination have both been established, the proposed connection wherein regulatory mode preferences mediate a relationship between attachment style and procrastination has never been tested. It is also important to note that the research supporting the relationship between attachment style and regulatory mode is in its infancy. Furthermore, the connections between the interpersonal functions represented by attachment theory's safe haven and the individual self-regulation tendencies represented by the concept of a secure base require better integration and explication. While a number of researchers have pursued lines of inquiry into the relationship between interpersonal functioning and individual self-regulation (e.g., Fitzsimons & Finkel, 2011; Feeney, 2004; McCulloch, Fitzsimons, Chua, & Albarracin, 2011; Rawn & Vohs, 2011; Richeson & Shelton, 2007) more needs to be done. Given how important

self-regulation is to achieving one's goals (Baumeister, Heatherton, & Tice, 1994) and functioning well in society (Zimmerman, 2000), it is important to understand how interpersonal functions such as attachment style affect self-regulatory preferences like regulatory mode and consequently affect behaviors such as procrastination.

The current study serves two purposes. First, it will provide further evidence for the relationship between attachment style and regulatory mode. Second, it will expand upon attachment style's secure base concept by examining how this relationship affects procrastination behaviors in the real world setting of academia. Given the importance of success in higher education to both individuals and society, the prevalence of procrastination among students (Day, Mensink, & O'Sullivan, 2000), and the serious outcomes associated with academic procrastination (Tice & Baumeister, 1997), this context provides both fruitful and imperative grounds for the proposed research. Additionally, this study will provide the opportunity to examine whether the predicted relationship between attachment style, regulatory mode, and procrastination also negatively affects student achievement (e.g. assignment grades).

To this end, the current study has two main hypotheses. First, it is predicted that avoidant attachment style, mediated through low locomotion, will predict higher rates of procrastination among university students as measured by both self-report trait procrastination and the time at which they turn in assignments. Second, it is predicted that anxious attachment style, mediated through high assessment, will predict higher rates of procrastination among university students as measured by both self-report trait procrastination and the time at which they turn in assignments. The secondary hypotheses are that in both cases the resultant higher procrastination will negatively affect students' grades.

2.0 METHODS

2.1 DESIGN

This study had an observational design in which students reported their attachment style, regulatory mode preferences, and trait level procrastination via self-report surveys. These surveys were completed near the beginning of the semester. Procrastination was measured behaviorally over the course of the semester by recording the date and time at which students electronically submitted homework assignments. It was expected that attachment style, mediated through regulatory mode, would predict procrastination. The students' grades on these homework assignments were also recorded. It was expected that increased procrastination would negatively affect assignment grades.

2.2 PARTICIPANTS

Students ($N = 201$) were recruited from two undergraduate Introduction to Social Psychology courses. Their ages ranged from 18 to 35 ($M = 19.8$, $SD = 1.87$) and 151 were female (75%). Of the total, 165 were Caucasian (82%), 22 were Asian (11%), five were African American (2.5%), and six identified as Hispanic or "other" (3%). A researcher gave a brief presentation during the first class following the withdraw deadline explaining the study's purpose and what participation

entails (e.g., filling out three questionnaires and giving permission to track the date and time their assignments are electronically submitted as well as their grades). Students were provided with individual consent forms to sign and submit to the researcher in order to participate in the study. Students were compensated with a choice of candy bar for their participation. Following this, students were not contacted again as their behavioral procrastination was measured via the electronic time stamps generated when they submitted in assignments.

2.3 MATERIALS

2.3.1 Attachment style

Participants completed a well-validated and widely used measure of attachment style. Given the findings of Cook (2000), Fraley and colleagues (2011), and Barry, Lakey and Orehek (2007) showing that attachment style can differ across relationships, participants were instructed to think of their closest school peer when completing this survey because their closest school peer is likely the most relevant and influential relationship students have in the context of school. This measure includes 18 statements regarding anxious attachment style (“I worry a lot about my relationship with my closest peer”) and 18 statements regarding avoidant attachment style (“My closest peer really understands me and my needs”, reverse scored) that are evaluated on a Likert scale from 1 “strongly disagree” to 7 “strongly agree” (Fraley, Waller, & Brennan, 2000). Anxious and avoidant attachment were scored by taking the mean of the responses for each attachment style with higher scores indicating more anxious or avoidant attachment. The current

study produced a Cronbach's alpha of .95 for the avoidance scale and an alpha of .94 for the anxious scale.

2.3.2 Regulatory mode

Participants completed a well-validated measure of regulatory mode. Participants were instructed to think of how they feel and behave when with their closest school peer. The relationship-specific measure of regulatory mode scale has been previously used by Orehek, Vazeou-Nieuwenhuis, and Quick (2014). This questionnaire consists of 12 items regarding locomotion ("By the time I accomplish a task, I already have the next one in mind") and 12 items regarding assessment ("I like evaluating other people's plans") which are evaluated on a six-point Likert scale ranging from 1 "strongly disagree" to 6 "strongly agree" (Kruglanski et al, 2000). Locomotion and assessment scores were calculated by taking the mean of the responses for each regulatory mode style, with higher mean scores indicating higher levels of each regulatory mode style. The current study produced a Cronbach's alpha of .83 for the locomotion scale and an alpha of .81 for the assessment scale.

2.3.3 Trait procrastination

Participants completed the Tuckman procrastination scale (1991) at the same time they completed the attachment and regulatory mode scales. This is a well validated scale consisting of 16 items ("I delay making tough decisions") which are evaluated on a four point scale ranging from "that's me for sure" to "that's not me for sure". For ease of interpretation, this scale was reversed during analysis such that higher scores indicate more procrastination and lower scores

indicate less procrastination. A procrastination score was generated by taking the mean of the responses. The current study produced a Cronbach's alpha of .92.

2.3.4 Behavioral procrastination

The method for measuring procrastination behaviorally closely followed the method used by Tice and Baumeister (1997). In their studies, mean scores on Lay's General Procrastination Scale (1986) were significantly correlated with the date upon which students turned in an assignment—where low-procrastinator scorers turned in the assignment early or on time and high-procrastination scorers turned the assignment in late or not at all.

In the current study, procrastination was measured behaviorally via the electronic time stamp obtained from the Courseweb site to which students submitted three homework assignments. The homework assignments for the two classes were identical and were distributed and due on the same dates. Assignment one was distributed the same day the self-report measures of attachment, regulatory mode, and procrastination were completed and it was due 12 days later. Assignment two was distributed 13 days after the self-report measures were completed and was due 10 days after that (23 days after the measures were completed). Assignment three was distributed 55 days after the self-report measures were completed and was due 10 days after that (65 days after the self-report measures were completed).

The assignments involved a planning on the part of students to complete. Assignment one required students to expose themselves to a persuasion attempt (such as engaging a salesperson) and then write a one page analytical reflection on the experience. Assignment two asked students to collect data in the field on the interactions between two groups of people and write a one page report on the data. Assignment three required students to enact a “day of compassion” during

which they were to spend the entire day acting as compassionately as possible. They then were to write a one page reflection on the experience. All assignments were submitted online through the designated website. Assignments that were turned in late were penalized 10% of the grade for every 24 hours late they were submitted.

Homework that was turned in at the deadline (11:59 pm of the given date) was given a value of zero. Homework that was turned in prior to the deadline was given a negative value based on how many minutes early it was submitted (i.e. turning in the homework six minutes early resulted in a value of negative six). Homework that was turned in after the deadline was given a positive value based on how many minutes late it was submitted (i.e. submitting the homework six minutes late resulted in a value of positive six). Positive values therefore indicate more procrastination and negative values indicate less procrastination.

A reliability analysis of the three procrastination scores resulted in a Cronbach's alpha of .72 indicating that participants procrastinated at a consistent rate across assignments. Therefore, for the purposes of analysis, the procrastination scores were standardized and then averaged across all three assignments to create one behavioral procrastination score.

2.3.5 Grades

Assignments were graded by the teaching assistants for the course using a common rubric to ensure consistency between the two classes. For the purposes of analysis, grades were converted into the decimal format of the given percent, standardized for each assignment, and averaged across all three assignments to create one performance score for each participant.

3.0 RESULTS

Correlations among the variables are presented in Table 1. Partial correlations controlling for anxious attachment and avoidant attachment due to their tendency to covary are presented in Table 2 and Table 3, respectively.

The first analyses performed were two regressions to examine whether this study's data align with previous findings regarding the ability of attachment style to predict regulatory mode preference. In the first regression anxious and avoidant attachment were set as the independent variables and assessment was set as the dependent variable. As expected, it was found that avoidant attachment significantly predicted locomotion $\beta = -0.27$, $t(198) = -3.27$, $p = .001$, but not assessment $\beta = -0.05$, $t(198) = -0.64$, $p = .52$. In the second regression anxious and avoidant attachment were set as the independent variables and locomotion was set as the dependent variable. Also as expected, anxious attachment significantly predicted assessment $\beta = 0.28$, $t(198) = 3.34$, $p = .001$, but not locomotion $\beta = -0.15$, $t(198) = -1.8$, $p = .07$.

The second analysis performed, following the analyses conducted by Pierro and colleagues (2011), was a regression to examine whether this study's data align with previous findings regarding the ability of regulatory mode preferences to predict trait procrastination. For this analysis assessment and locomotion were set as the independent variables and trait procrastination was set as the dependent variable. As expected, it was found that locomotion

significantly predicted trait procrastination, $\beta = -0.60$, $t(194) = -10.55$, $p < .001$, as did assessment $\beta = 0.15$, $t(194) = 2.55$, $p = .01$.

The next step was to analyze the hypothesized paths from attachment style, through regulatory mode, to procrastination. The data was analyzed using Hayes' (2013) PROCESS procedure utilizing model four which allows for a single mediator. Four separate models were entered for analysis, as described below. Each of the following analyses control for the alternative attachment style and its associated regulatory mode due to the tendency of these variables to covary and the fact that an individual could potentially score high on both locomotion and assessment preference, which would lead to conflicting predictions concerning procrastination behavior.

The first model set the participants' avoidant attachment score as the independent variable, their locomotion score as the mediator, their trait procrastination score as the dependent variable, and controlled for their anxious attachment and assessment scores. The full model gave a significant indirect effect, 95% CI = [0.0230, 0.1504]. Each step of the model was significant in the expected directions (See Figure 1).

The second model set the participants' anxious attachment score as the independent variable, their assessment score as the first mediator, their trait procrastination score as the dependent variable, and controlled for their avoidant attachment and locomotion scores. The full model did not give a significant indirect effect, 95% CI = [-0.0003, 0.0567], however each step of the model was significant in the expected directions (See Figure 2).

The third model set the participants' avoidant attachment score as the independent variable, their locomotion score as the mediator, their behavioral procrastination (standardized and averaged across the three assignments) score as the dependent variable, and controlled for

their anxious attachment and assessment scores. The full model gave a significant indirect effect, 95% CI = [0.0039, 0.0897], however only the first step of the model was significant in the expected direction (See Figure 3).

The fourth model set the participants' anxious attachment score as the independent variable, their assessment score as the first mediator, their behavioral procrastination score (standardized and averaged across the three assignments) as the dependent variable, and controlled for their avoidant attachment and locomotion scores. The full model did not give a significant indirect effect, 95% CI = [-0.0088, 0.0897], and only the first step of the model was significant in the expected direction (See Figure 4).

It was then proposed that the path to behavioral procrastination may also be mediated by trait procrastination. To examine this model the data was analyzed using Hayes' (2013) PROCESS procedure utilizing model six which allows for multiple sequential mediators. Two separate models were entered for analysis, as described below.

The first model set the participants' avoidant attachment score as the independent variable, their locomotion score as the first mediator, their trait procrastination score as the second mediator, their behavioral procrastination score (standardized and averaged across the three assignments) as the dependent variable, and controlled for their anxious attachment and assessment scores. The full model gave a significant indirect effect, 95% CI = [0.0137, 0.1124]. Each step of the model was significant in the expected directions (See Figure 5).

The second model set the participants' anxious attachment score as the independent variable, their assessment score as the first mediator, their trait procrastination score as the second mediator, their behavioral procrastination score (standardized and averaged across the three assignments) as the dependent variable, and controlled for their avoidant attachment and

locomotion scores. The full model gave a significant indirect effect, 95% CI = [0.0008, 0.0353]. Each step of the model was significant in the expected directions (See Figure 6).

The final step was to analyze the full path from attachment style, through regulatory mode, trait procrastination, and behavioral procrastination, to assignment grade. The data was analyzed using Hayes' (2013) PROCESS procedure utilizing model six which allows for multiple sequential mediators. Two separate models were entered for analysis, as described below.

The first model set the participants' avoidant attachment score as the independent variable, their locomotion score as the first mediator, their trait procrastination score as the second mediator, their behavioral procrastination score (standardized and averaged across the three assignments) as the third mediator, their assignment grade (standardized and averaged across the three assignments) as the dependent variable, and controlled for their anxious attachment and assessment scores. The full model gave a significant indirect effect, 95% CI = [-0.0219, -0.0021]. Each step of the model was significant in the expected directions (See Figure 7).

Further analyses were performed on this model to examine whether other orders of the variables would also be significant. Specifically, the three measures completed at time one (attachment style, regulatory mode preference, and trait procrastination) were each examined in the first, second, and third positions in the model relative to each other. None of these alternative models yielded significant results in that none of the full models' confidence intervals excluded zero.

The second model set the participants' anxious attachment score as the independent variable, their assessment score as the first mediator, their trait procrastination score as the

second mediator, their behavioral procrastination score (standardized and averaged across the three assignments) as the third mediator, their assignment grade (standardized and averaged across the three assignments) as the dependent variable, and controlled for their avoidant attachment and locomotion scores. The full model gave a significant indirect effect, 95% CI = [-0.0068, -0.0002]. Each step of the model was significant in the expected directions (See Figure 8).

Further analyses were performed on this model to examine whether other orders of the variables would also be significant. Specifically, the three measures completed at time one (attachment style, regulatory mode preference, and trait procrastination) were each examined in the first, second, and third positions in the model relative to each other. None of these alternative models yielded significant results in that none of the full models' confidence intervals excluded zero.

4.0 DISCUSSION

This study had two main hypotheses. First, it was predicted that avoidant attachment style, mediated through low locomotion, would predict higher rates of procrastination due to avoidant attachment's tendency to disengage generalizing to individual goal pursuit. This disengagement was proposed to lead to low locomotion tendencies, which would increase procrastination. Second, it was predicted that anxious attachment style, mediated through high assessment, would predict higher rates of procrastination due to anxious attachment's tendency to engage in hypervigilance which would impede engagement in goal directed behavior. This hypervigilance would translate into higher assessment tendencies which would then increase procrastination. Additionally, given that procrastination is defined as delaying or avoiding engaging in goal pursuit when such delay is not strategic and harms eventual achievement, it was further predicted that these increases in procrastination would be negatively associated with grades.

The first hypothesis was partially supported by the data. The model predicting behavioral procrastination via avoidant attachment mediated through locomotion was not significant. However, the model predicting procrastination via avoidant attachment style mediated through locomotion was significant for trait procrastination and for behavioral procrastination when trait procrastination was entered as a second mediator. Additionally, it was found that avoidant attachment mediated through low locomotion, high self-reported trait procrastination, and high behavioral procrastination predicted performance on class assignments among university

students over the course of two months during the school semester. Furthermore, reordering the time one variables in this model did not give significant results, supporting the proposed theoretical pathway.

The second hypothesis was also partially supported by the data. The model predicting trait procrastination via anxious attachment mediated through assessment did not reach significance. However, the model predicting behavioral procrastination via avoidant attachment style mediated through locomotion and trait procrastination was significant. Additionally, it was found that anxious attachment style mediated through high assessment, high self-reported trait procrastination, and high behavioral procrastination predicted performance on class assignments among university students over the course of two months during the school semester. Furthermore, reordering the time one variables in the model did not give significant results, supporting the proposed theoretical pathway.

The findings of this study successfully replicated the work by Orehek and colleagues (2014) supporting the predicted relationships between avoidant attachment and low locomotion, and anxious attachment and high assessment. Previous work on regulatory mode theory has only speculated on what factors may influence how an individual comes to prefer locomotion or assessment behaviors for goal pursuit. These results lend further support to the recent findings establishing a link between attachment style and regulatory mode preferences (Orehek, et al., 2014). This study also replicated the previous findings of Pierro and colleagues (2011) supporting the predicted relationships between regulatory mode and trait procrastination.

The current study built on the previous findings by proposing and finding support for a mediated pathway between attachment style, regulatory mode preference, trait and behavioral procrastination, and grades. An individual's attachment style not only influences their

interpersonal behaviors related to seeking out a safe haven for care, but also their independent exploratory and goal driven behaviors associated with having a secure base. In this study, it was found that attachment styles have a relationship with achievement as measured by grades on course work that is mediated by regulatory mode preferences and both trait level procrastination and specific instances of behavioral procrastination. This indicates that the effects of attachment style's secure base can have significant downstream effects on an individual's achievement.

This study makes a contribution toward understanding the relationship between interpersonal processes and individual goal pursuit behaviors. Procrastination is only one goal pursuit behavior that may be affected by the relationship between attachment and regulatory mode, and others should be examined as well. Expanding on the relationship between attachment and regulatory mode and its consequences should provide fertile ground for further research in these areas. For example, locomotors and assessors prefer different types of means during goal pursuit, with locomotors preferring means attached to a single goal and assessors preferring means attached to multiple goals (Orehek, Mauro, Kruglanski, & van der Bles, 2012). Attachment styles may similarly predict means preference. Because people can serve as means to goals (Fitzsimons & Fishbach, 2010; Fitzsimons & Shah, 2008; Orehek & Forest, 2015), it may be the case that attachment styles predict a preference for task-specific versus multi-purpose social connections.

Understanding the pathway from personal relationships to individual outcomes such as grades provides a number of potential entry points for corrective action. Currently, a student who seeks guidance because they are doing poorly in classes will likely be counseled on things like study habits in the hopes that they will understand the course material better. An implication of the current study is that, in addition to making sure course material is clear, students and their

counselors may also want to take a look at their procrastination behaviors. If it were to be decided that the student's procrastination issues need to be addressed, the counselor could examine and attempt to affect the student's regulatory mode preferences. Previous research has shown that regulatory mode can be influenced by certain manipulations (Orehek et al, 2012; Avnet & Higgins, 2003), which could allow for some type of intervention to be developed for students who desire to procrastinate less. Somewhat more removed from the issue, addressing the student's attachment style may also affect their regulatory mode preference, and therefore their procrastination. However, this is a more indirect route that has its own unique challenges; adjusting one's existing attachment style with someone would likely be an involved process not suitable for the limited time span of a school semester, though it might be a suitable avenue for longer term changes.

Additionally, given that there was a significant relationship between behavioral procrastination and grades indicating that more procrastination resulted in lower grades, this finding supports using this particular method to measure procrastination behaviorally. While a definite limitation of using the submission date of an assignment as a proxy for procrastination is that one cannot be sure whether any individual submission date is the result of strategic delay or true procrastination, the negative relationship with grades indicates that most of the observed delay in submission time was in fact not conducive to earning better grades.

In sum, this study has provided the first empirical evidence supporting a model pathway from attachment style to self-regulation to behavior to achievement. It has also helped validate submission time as a valid behavioral measure of procrastination. It is my hope that this work will serve as a launching point from which to further explore individuals' "failure to launch" and more

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APPENDIX A

TABLES

Table 1. Descriptive statistics and correlation matrix

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1 Avoidant Att.	2.23	1.03	-					
2 Anxious Att.	2.29	1.08	.58**	-				
3 Locomotion	4.42	.62	-.35**	-.30**	-			
4 Assessment	4.29	.65	.11	.25**	.068	-		
5 Trait Procrastination	2.28	.58	.22**	.27**	-.59**	.10	-	
6 Behavioral Procrastination	-1283.63	1470.08	.15*	.14*	-.17**	.12	.32**	-
7 Assignment Grade	92.89	11.19	-.15*	-.14*	.14 ⁺	.06	-.19**	-.21**
<i>N = 201</i>	⁺ p<.06	*p<.05	** p<.01					

Note- Assignment Grade *M* is to be read as a percent. Behavioral Procrastination *M* is in minutes.

Table 2. Descriptive statistics and partial correlation matrix controlling for anxious attachment

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1 Avoidant Att.	2.22	1.00	-				
2 Locomotion	4.42	.62	-.21**	-			
3 Assessment	4.29	.65	-.07	.16*	-		
4 Trait Procrastination	2.28	.58	.08	-.56**	.04	-	
5 Behavioral Procrastination	-1283.63	1470.08	.06	-.13 ⁺	.08	.29**	-
7 Assignment Grade	92.89	11.19	-.07	.10	.11	-.16*	-.19**
<i>N</i> = 197	⁺ p<.07	*p<.05	** p<.01				

Note- Assignment Grade *M* is to be read as a percent. Behavioral Procrastination *M* is in minutes.

Table 3. Descriptive statistics and partial correlation matrix controlling for avoidant attachment

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1 Anxious Att.	2.30	1.09	-				
2 Locomotion	4.42	.62	-.13 ⁺	-			
3 Assessment	4.29	.65	.24**	.11	-		
4 Trait Procrastination	2.28	.58	.18*	-.56**	.08	-	
5 Behavioral Procrastination	-1283.63	1470.08	.08	-.13	.10	.30**	-
6 Assignment Grade	92.89	11.19	-.07	.09	.08	-.16*	-.19**
<i>N</i> = 197	⁺ p<.07	*p<.05	** p<.01				

Note- Assignment Grade *M* is to be read as a percent. Behavioral Procrastination *M* is in minutes.

APPENDIX B

FIGURES

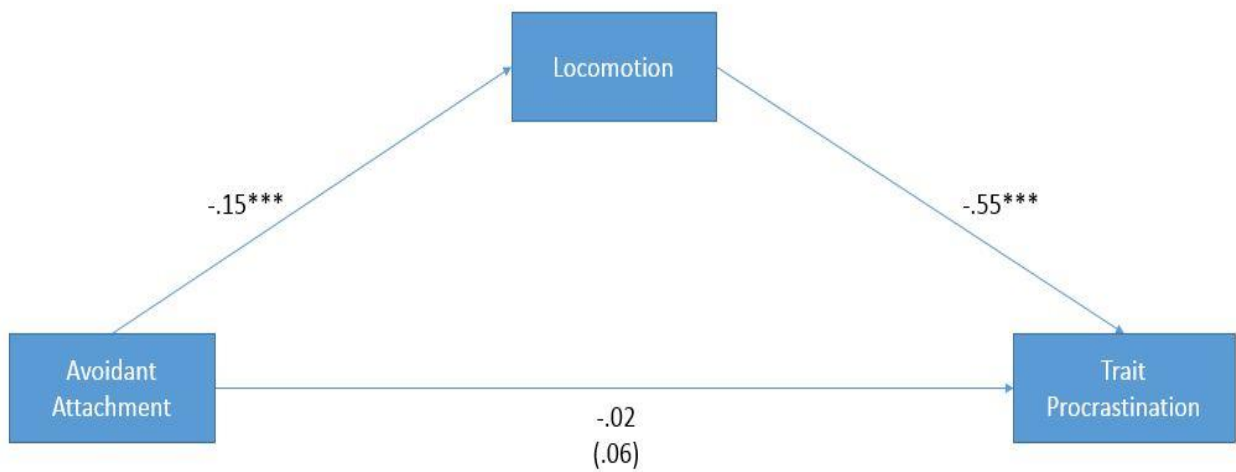


Figure 1. Mediation model examining the effect of avoidant attachment (with anxious attachment and assessment controlled for) on trait procrastination via locomotion. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. $*** p < .001$. $* p < .05$

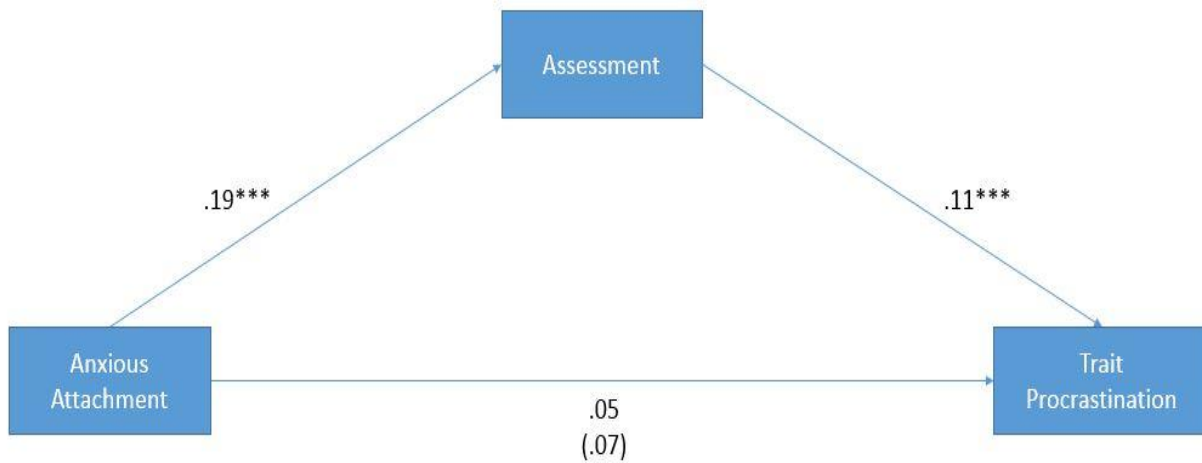


Figure 2. Mediation model examining the effect of anxious attachment (with avoidant attachment and locomotion controlled for) on trait procrastination via assessment. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. $*** p < .001$. $* p < .05$

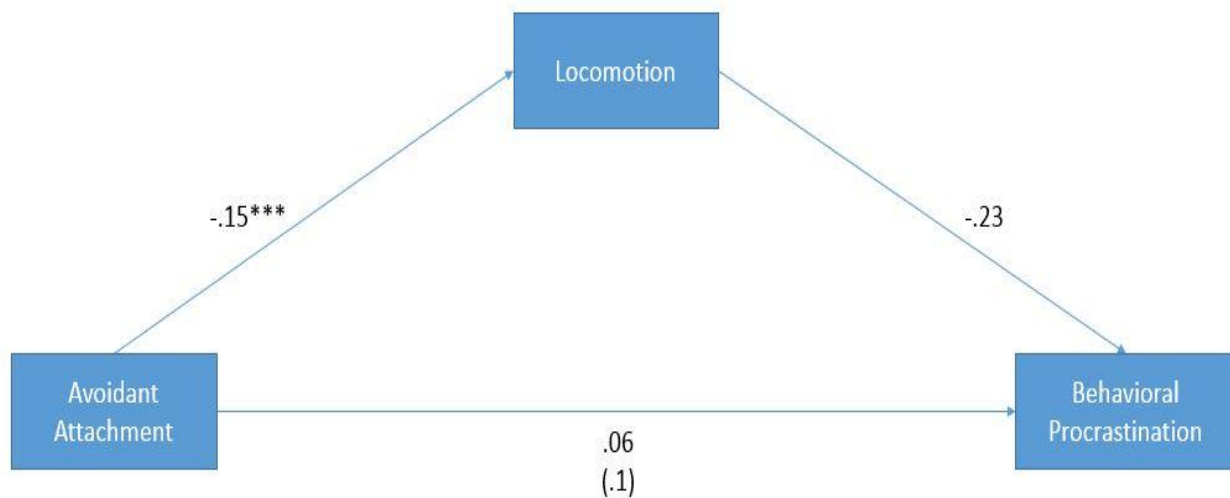


Figure 3. Mediation model examining the effect of avoidant attachment (with anxious attachment and assessment controlled for) on behavioral procrastination via locomotion. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. $*** p < .001$. $* p < .05$

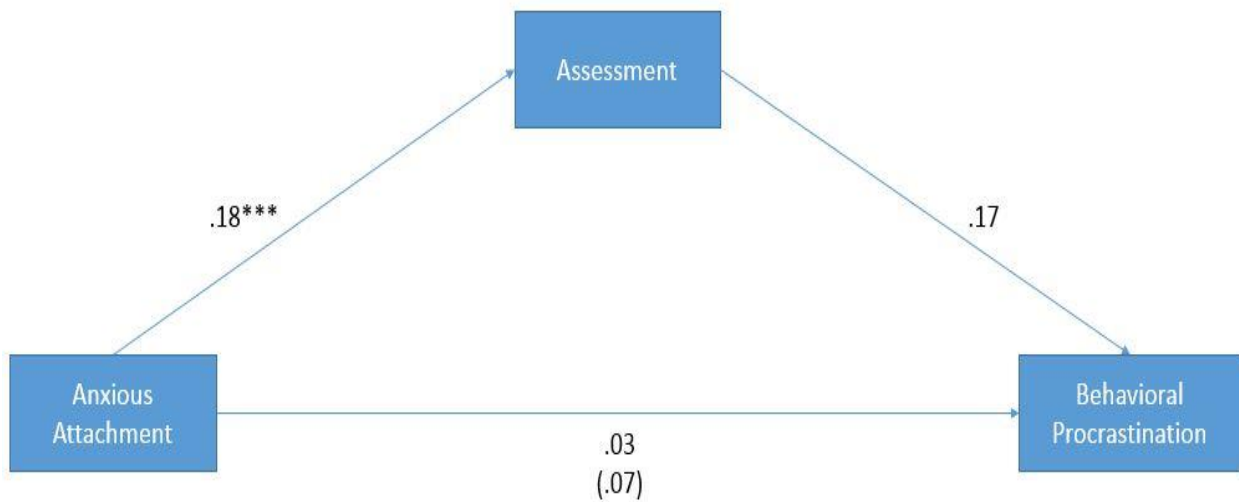


Figure 4. Mediation model examining the effect of anxious attachment (with avoidant attachment and locomotion controlled for) on behavioral procrastination via assessment. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. *** $p < .001$. * $p < .05$

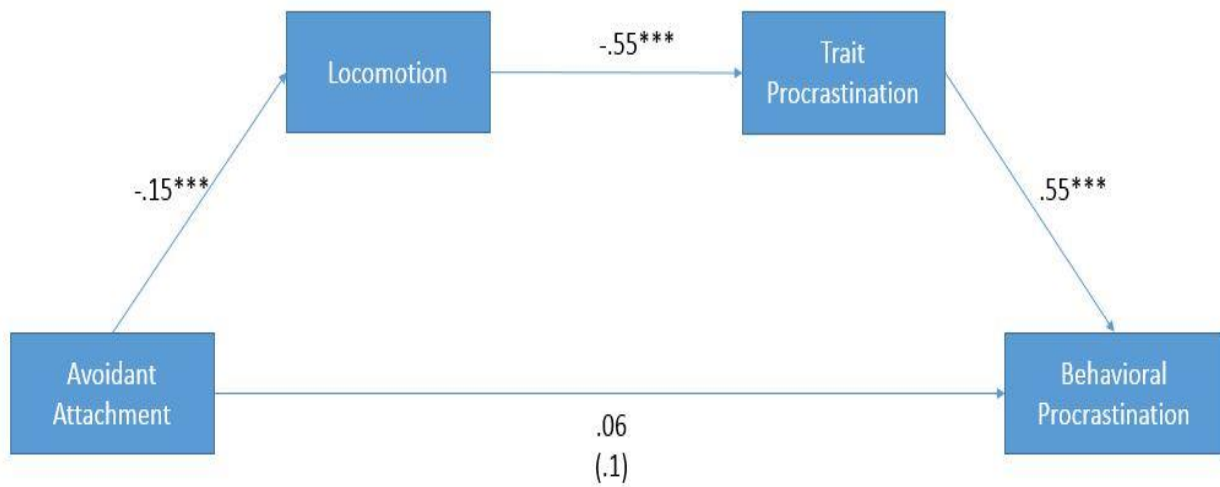


Figure 5. Mediation model examining the effect of avoidant attachment (with anxious attachment and assessment controlled for) on behavioral procrastination via locomotion and trait procrastination. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. *** $p < .001$. * $p < .05$

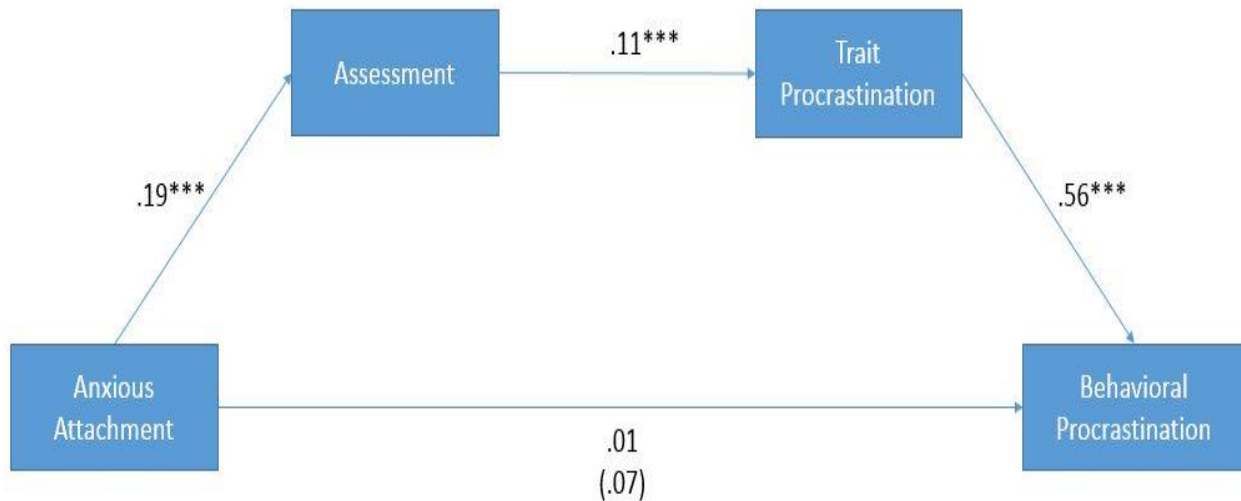


Figure 6. Mediation model examining the effect of anxious attachment (with avoidant attachment and locomotion controlled for) on behavioral procrastination via assessment and trait procrastination. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. *** $p < .001$. * $p < .05$

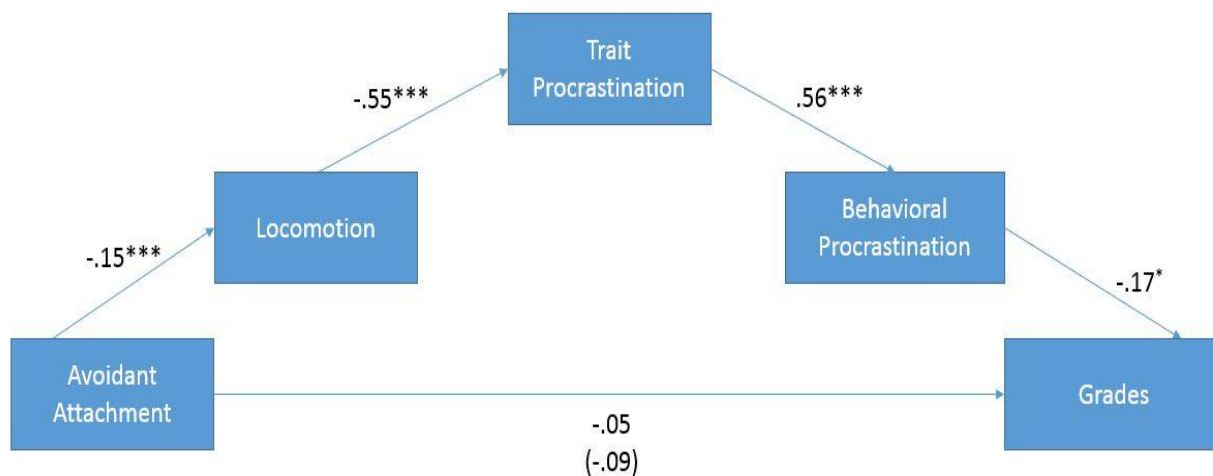


Figure 7. Mediation model examining the effect of avoidant attachment (with anxious attachment and assessment controlled for) on grades via locomotion, trait procrastination, and behavioral procrastination. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. All paths were tested but only those proposed are included in the figure for visual clarity. *** $p < .001$. * $p < .05$

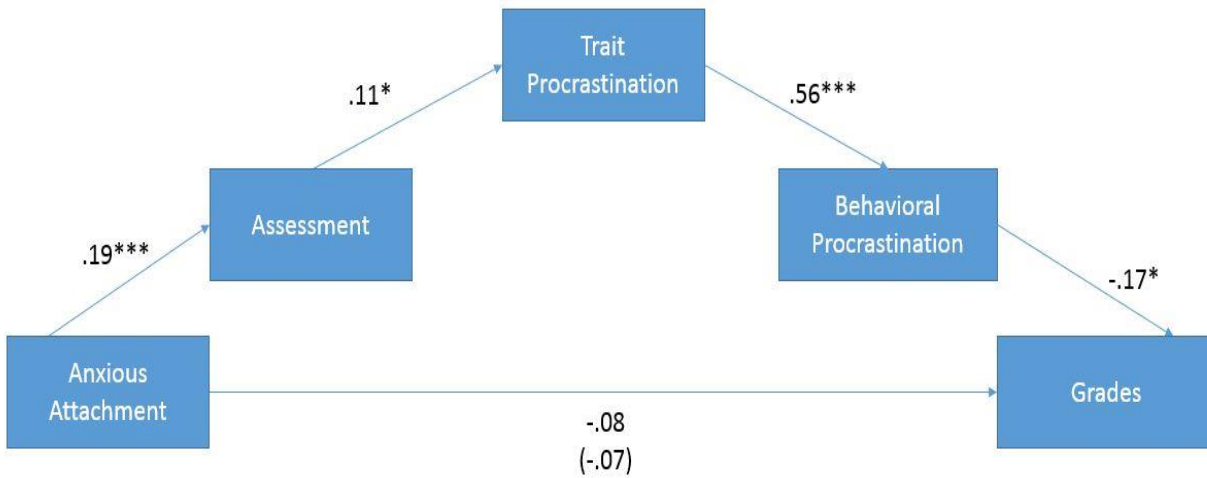


Figure 8. Mediation model examining the effect of anxious attachment (with avoidant attachment and locomotion controlled for) on grades via assessment, trait procrastination, and behavioral procrastination. Path coefficients are unstandardized. The parenthetical number indicates the path coefficient before including the mediators. All paths were tested but only those proposed are included in the figure for visual clarity. $^{***} p < .001$. $^* p < .05$