The Role of Psychological Flexibility in Procrastination

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Introduction

Ben Franklin (1758/2007) once said, “you may delay, but time will not.” This statement may be even more relevant now than it was in colonial America. Up to one-fourth of the general population struggles with some form of procrastination (Ferrari, Diaz-Morales, O’Callaghan, Diaz, & Argumedo, 2007). Procrastination is observed in everyday tasks such as putting off grocery shopping, making lunches for the kids the night before, or planning a party. However, these seemingly simple acts of procrastination often affect important areas of overall well-being (Klingsieck, 2013). Procrastination is associated with poor financial stability (Elliot, 2002; Klingsieck, 2013; Steel, 2007) and physical health problems (Klingsieck, 2013; Sirois, 2004; Sirois, Melia-Gordan, & Pychyl, 2003; Stead, Shanahan, & Neufeld, 2010; Tice & Baumeister, 1997). In addition, it has been linked to depression (Solomon & Rothblum, 1984), anxiety (Ferrari, Johnson, & McCown, 1995; Ottens, 1982), stress (Holloway, 2009), and a number of related psychological conditions (Persaud, 2005).

The impacts of procrastination may be most evident in the college population where about 95% of students procrastinate (Ellis & Knaus, 2007; O’Brien, 2002). Of the large number of college students who procrastinate, 50% of college procrastinators report behaving in this way consistently (Day, 2000). In fact, one-third of college students’ daily activities are procrastination-related (Pychyl, Lee, Thibodeau, & Blunt, 2000).

Because procrastination has been linked to poor college outcomes, it has become a recent focus of college student well-being (Tice & Baumeister, 1997; van Eerde, 2003). Students who engage in procrastinatory behaviors are more anxious (Klingsieck, 2013;

Rothblum, Solomon, & Murakami, 1986) and are often more irritable before a test (Klingsieck, 2013; Lay & Schouwenburg, 1993). Procrastination in college students is linked with low grades and dropped courses (Rothblum, Solomon, & Murakami, 1986; Tice & Baumeister, 1997; Wesley, 1994). Delaying preparation can even lead to cheating and plagiarism (Roig & DeTommosso, 1995).

Procrastination

Defining procrastination. Though procrastination continues to gain attention in both the media and academia, it has yet to be clearly defined. Procrastination, in general terms, is the act of putting off or delaying a particular action (Merriam-Webster, 2013). The meaning of procrastination is evident in the Latin root of *pro* meaning "forward, forth, or in favor of," and *crastinus* meaning "of tomorrow" (Klein, 1971; Steel, 2007). A recent review defines procrastination more specifically as the voluntary act of putting off or delaying a necessary or important activity, despite knowing that negative outcomes will outweigh the positive ones (Klingsieck, 2013; Steel, 2007). This refined definition emphasizes three important points: 1) the behavior must be problematic (Sirios, 2004; Tice & Baumeister, 1997; van Errde, 2003), 2) the behavior must be voluntary (Milgram, Mey-Tal, & Levinson, 1998), and 3) the behavior must be related to something perceived as important or necessary (Klingsieck, 2013; Lay, 1986; Steel, 2007).

Procrastination is problematic. Some (e.g., Chu & Choi, 2005; Lundstrom, 2010) have distinguished functional procrastination from dysfunctional procrastination, positing that functional procrastination can allow one to better prepare to be most effective or efficient with a task. Researchers who support the idea of functional procrastination

describe it as the rational or necessary delaying of a task resulting in positive outcomes (e.g., active procrastination; Chu & Choi, 2005). For example, a student may delay studying for a test because she is organizing her study materials or creating a study plan. Although she is postponing studying, the overall effect may be beneficial in that she will perform better on her test. However, many (e.g., Corkin, Yu, & Lindt, 2011; Ferrari, 2010; Pychyl, 2009) have noted that this kind of purposeful delay (e.g., organizing materials or making a study plan) is not procrastination at all because it is not problematic. By definition, procrastination involves delay *with negative consequences*.

Procrastination is voluntary. Another essential characteristic of procrastination is the notion that the action must be voluntary and not imposed by an external source (Milgram, Mey-Tal, & Levinson, 1998). For example, if an employee puts off completing task B because he is told by his boss to prioritize task A over task B, this would not be considered procrastination. The employee is following directions, so the delay of task B is involuntary.

Although procrastinatory behavior is, by definition, voluntary, the procrastinating person may not always be aware of his motives (Klingsieck, 2013; Milgram, Mey-Tal, & Levinson, 1998). A person may put off studying and not realize that he is doing so because of anxiety, fear of failure, or low self-esteem. In other words, a person can intentionally procrastinate without understanding the function of his procrastination.

Procrastination interferes with important tasks. Lastly, the task that is being put off must be necessary or important to someone to be considered procrastination (Lay, 1986). For example, someone who puts off delivering their dry cleaning is not procrastinating

unless the clothes are necessary to reach a goal. They may simply be delaying because the task at hand is less important in comparison to their other tasks.

Understanding and intervening on procrastination. In attempting to understand procrastination, researchers have considered everything from associated neurological factors (Rabin, Fogel, & Nutter-Upham, 2011) to predisposing parenting styles (Pychyl, Coplan, & Reid, 2002). In a recent review, Klingsieck (2013) identified four broad perspectives that have contributed to an understanding of procrastination: 1) procrastination as a function of personality, 2) procrastination as deficit in motivation, 3) procrastination as a function of the situation, and 4) procrastination as a clinical issue. Personality, clinical, and motivational perspectives are person-centered, emphasizing procrastination as caused by an individual's characteristics, wants, needs, abilities, or general attributes. The situational perspective is unique in that it emphasizes the specific contingencies that support procrastination.

***Procrastination as a personality*.** One of the more heavily researched and developed perspectives views procrastination as a personality trait (Ferrari, 2010; Steel, 2007). This perspective is based mainly on the five-factor model of personality. Procrastination is positively correlated with neuroticism and negatively correlated with conscientiousness (Johnson & Bloom, 1995; Steel, 2007). Procrastinators are concerned, but lack the skills to navigate those concerns. Procrastination is more likely amongst those with low self-esteem (Ferrari, 1994, 2000; Pychyl, Coplan, & Reid, 2002) as well as those with high impulsiveness (Blatt & Quinn, 1967). Procrastination has also been described as a *self-defeating behavior* (Baumeister & Scher, 1988; Ferrari & Tice, 2000), where people

undermine their chances of good performance as a means to protect their self-competence (Jones & Berglas, 1978).

Procrastination interventions based in the personality perspective focus on self-regulation of problematic personality traits. For example, Lay (2004) describes administering group sessions to students and faculty members who score high on his Trait Procrastination Scale (Lay, 1986), focusing on how procrastination is a result of their personality traits (e.g. rebelliousness, low self-esteem, neurotic disorganization). Although Lay (2004) reports successful results over the last 10 years, he has not developed a systematic way to assess the outcomes of the program.

Procrastination as a lack of motivation. Some researchers (Lay, 1986; Steel, 2007) understand procrastination as due to lack of motivation. Procrastination is negatively correlated with motivational variables such as intrinsic motivation (Brownlow & Reasinger, 2000), self-determination (Sencal, Julien, & Guay, 2003), self-efficacy (Haycock, McCarthy, & Sky, 1998), and flow-inducing activities (Seo, 2011). Similarly, volitional approaches focus on procrastination as it relates to self-regulation (Dietz, Hofer, & Fries, 2007; Sencal, Koestner, & Vallerand, 1995; Wolters, 2003) and action-control (Blunt & Pychyl, 2005). For example, Temporal Motivation Theory (TMT; Gropel & Steel, 2008; Steel & Konig, 2006) offers a mathematical equation that utilizes expectancy, value, impulsiveness, and delay as factors to indicate motivational deficits and identify the effect of time on personal motivation.

Interventions based in motivational and volitional approaches promote self-regulation of motivation, primarily using goal setting (Gropel & Steel, 2008). For example, a recent study found that goal setting was less effective for those with interest enhancement

compared to those without an interest enhancement, in terms of procrastination. The promotion of goal-setting was only beneficial for those who lacked interests. The authors suggest that using a more individual skill intervention would result in stronger effects and thus provide more motivation (Gropel & Steel, 2008). With time, the aim is to translate predictive models such as that those offered by TMT into person-specific interventions (Gropel & Steel, 2008).

Procrastination as a function of the situation. A less researched and often overlooked perspective is the situational approach (Klingsieck, 2013). This approach focuses on the elements of the context, rather than characteristics of the procrastinating person, postulating that the situational factors are what elicit procrastination. This perspective highlights the importance of task aversiveness and attractiveness (Ackerman & Gross, 2005; Blunt & Pychyl, 2000; Ferrari & Scher, 2000; Klingsieck, 2013; Lay, 1992; Milgram, Marshevsky, & Sadeh, 1995; Milgram et al., 1988; Pychyl et al., 2000) as well as teacher characteristics (Schraw, 2007).

Procrastination interventions from the situational approach involve behavioral management strategies that reduce aversive features associated with situational factors such as the task, assignment, or professor. These types of interventions aim at modifying maladaptive behaviors by controlling the evoking environmental stimuli (Cullinan, 2002; Kavale, Forness, & Walker, 1999; Mathur, Quinn, & Rutherford, 1996; Tuckman & Schouwenburg, 2004). For example, Lopez and Wambach (1982) showed that self-monitoring with self-reinforcement significantly decreased procrastination compared to

control groups. In addition, another study found that self-monitoring techniques were more effective compared to skills-study techniques (Groveman, Richards & Caple, 1977).

Procrastination as a clinical concern. The clinical perspective approaches procrastination as a mental disorder, focusing on symptomology, comorbidity, and treatment development (Schouwenburg et al., 2004). Procrastination is associated with both high stress and maladaptive stress relief (Flett, Blankstein, & Martin, 1995; Jackson et al., 2000; Tice & Baumeister, 1997). Procrastination has been linked to a number of Axis I disorders, including ADHD (Ferrari & Sander, 2006), depression (Flett, Blankstein, & Martin, 1995; Solomon & Rothblum, 1984), and anxiety (Fritzche, Young, & Hickson, 2003; Milgram & Toubiana, 1999). Procrastination is also more common amongst those diagnosed with personality disorders (Ferrari et al., 1995; Chapter 8). Accordingly, some have proposed that procrastination be reviewed for consideration as its own diagnostic category due to its significant associated dysfunction and relatively low levels of overlap with existing disorders (Engberding, Frings, Höcker, Wolf, & Rist, 2011).

Cognitive-behavioral therapies (CBT), pharmaceuticals, and psychodynamic therapies have been adapted for use with procrastination. Psycho-pharmaceutical methods are used to treat symptoms related to procrastination (e.g., anxiety and depression), rather than procrastination itself. Common treatment drugs include benzodiazepines and anti-depressants (Ferrari, 1995). Psychodynamic approaches view procrastination as an unresolved, unconscious conflict (Corey, 1996). It aims at reworking and changing interpersonal constructs from childhood by focusing on the past and self (Wolfe & Dryden, 1996). Both the psycho-pharmaceutical and psychodynamic approaches are only used in

more serious cases of procrastination in which the behavior is preventing daily functioning (Ferrari, 1995).

The most common procrastination treatments are CBT-based interventions, most of which are based on Rational Emotive Behavior Therapy (REBT; Ellis & Harper, 1997; Ellis & Knaus, 2002). REBT focuses on changing behavior by changing people's irrational cognitions (i.e., thoughts, images, beliefs and attitudes) through disputation and evaluation. According to REBT, acknowledging disturbances resulting from irrational thinking, recognizing past successful evaluation of irrational beliefs, and using both of these strategies in combination can lead to positive behavioral change. Recent data on CBT-related interventions, including REBT, have found these to be efficacious treatments of procrastination (van Essen, van den Hueval, & Osebaard, 2004).

Procrastination as a function of person-in-context. A fifth alternative approach that has not been yet represented in the literature offers an account of behavior that is both situation- and person-centered. Contextual behaviorism (CBS; Vilardaga, Hayes, Levin, & Muto, 2009) posits that behavior cannot be understood independent of the context in which that behavior is emitted. From a CBS perspective, context includes not only the immediate contingencies supporting that behavior, but also the individual's learning history and broader behavioral repertoire. In this way, a contextual behavioral analysis takes into account both situational variables and individual differences (i.e., a person's repertoire and specific learning history). CBS is also decidedly pragmatic, focusing on the application of the analysis to alleviate human suffering and promote human well-being (Hayes, Barnes-Holmes & Wilson, 2012).

Applied to procrastination, CBS would suggest that due to a person's specific learning history, aspects of a necessary and/or important task become aversive, narrowing their behavioral repertoire such that avoidance of the task dominates over more adaptive behaviors. Indeed, procrastination seems to be related to avoidance (Ferrari, 1992b; Ferrari et al., 2009; Psychl & Flett, 2012). Further, a CBS-based intervention would focus on 1) changing the context in such a way as to shift functions of the aversive task and 2) building a broad and flexible repertoire that allows for access to that which is important and necessary. Thus, the contextual behavioral analysis sets ground for an integrated understanding of procrastination with direct implications for intervention by understanding procrastination as *experiential avoidance*.

Procrastination and experiential avoidance. Procrastination can serve different functions ranging from avoidance of fear of failure (Onwuegbuzie & Collins, 2001) to avoidance of fear of success (Burka & Yuen, 2008). The task may be perceived as too difficult, overwhelming, or unpleasant (Blunt & Psychl, 2000; Senecal et al, 1995). For example, Tice and Baumeister (1997) found that students who avoided assignments reported lower levels of stress and illness early in the semester, but significantly higher levels of stress and illness at the end. In addition, students who avoided assignments had lower grades than those who did not procrastinate. In other words, procrastination involves avoidance of a task in such a way as to suppress, change, or postpone an unwanted experience, otherwise known as *experiential avoidance*.

From a CBS perspective, experiential avoidance is a fundamental psychological vulnerability (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hayes, Strosahl, & Wilson, 1999;

Kashdan, Barrios, Forsyth, & Steger, 2006). Although experiential avoidance may be effective in the short term, it is often not beneficial in the long term. In fact, studies show that the more one attempts to suppress or not think about certain experiences, the more likely these experiences are to occur (Wenzlaff & Wegner, 2000). This process can serve as a catalyst, creating a maladaptive behavioral loop leading to severe psychological effects, such as panic or obsessive-compulsive behavior (Hayes & Gifford, 1997). Further, experiential avoidance has been linked to a variety of psychological disorders such as depression (Kashdan et al., 2006; Roemer, Salters, Raffa, & Orsillo, 2005; Tull, Gratz, Salters, & Roemer, 2004), anxiety (Roemer et al., 2005; Tull et al., 2004), post-traumatic stress disorder (Marx & Sloan, 2005), and substance use disorders (Stewart, Zvolensky, & Eifert, 2002). Procrastination, characterized by experiential avoidance, seems to function in much the same way as these psychological disorders. Likewise, interventions that target experiential avoidance may be ideal.

Although there are different clinical applications rooted in the CBS perspective, none have been explored as a treatment option for procrastination. Given that procrastination involves avoidance and a failure to exert control over thoughts, emotions, impulses, and behaviors (Baumeister & Vohs, 2004), Acceptance and Commitment Therapy (ACT) could be a useful mechanism in tackling procrastinatory behavior. Not only does ACT embrace a contextual behavioral perspective, but it also has been used as treatment for problems based on experiential avoidance.

ACT is a form of cognitive-behavioral therapy (CBT). Although ACT is similar to traditional CBT, it differs in that it focuses on changing one's relationship with their

thoughts rather than changing thoughts. This method reduces the impact of thoughts and their content on behavior. Furthermore, coming into contact with difficult thoughts or emotions has been found to reduce distress (Kashdan & Rottenburg, 2010). Based on this notion, the acceptance approach may be particularly useful for avoidant behaviors, notably procrastination.

As problems related to experiential avoidance increase, so does behavioral rigidity (Hayes & Gifford, 1997), limiting one's ability to engage in meaningful actions (e.g., psychological inflexibility). Being that it is basically a maladaptive coping strategy, experiential avoidance encompasses a wide range of avoidant behaviors, including procrastination. As reviewed earlier, procrastination has been described as an ineffective coping style leading to negative consequences (Burns, Dittmann, Nguyen & Mitchelson, 2000). Given the conceptualization of psychological flexibility, procrastination can be considered a form of experiential avoidance.

Acceptance and Commitment Training

Acceptance and Commitment Therapy (ACT: Hayes, Strosahl, & Wilson, 1999; 2011) is a cognitive-behavioral therapy that that focuses on decreasing experiential avoidance and increasing values-based behavior (Hayes et al., 1999). ACT combines mindfulness and acceptance strategies with behavioral change techniques to increase *psychological flexibility*, or the capacity to maintain purposeful and effective behavior, even in the presence of difficult, unwanted experiences (Hayes et al., 2011). From an ACT perspective, psychological flexibility is a fundamental aspect of psychological well-being (Kashdan & Rottenberg, 2010). To increase psychological flexibility, ACT focuses on six interrelated

processes: 1) using *cognitive defusion* to disrupt the effects of rigid, problematic cognitions, 2) enhancing *experiential acceptance* of distressing experiences, 3) increasing *contact with present moment*, 4) establishing a consistent *self-perspective*, 5) *clarifying values* in multiple domains, and 6) enhancing effective *committed actions* towards values (Blackledge & Barnes-Holmes, 2009).

Using ACT to build psychological flexibility has been shown to decrease dangerous behaviors like self-harm (Gratz & Gunderson, 2006) and substance abuse (Luoma, Kohlenberg, Hayes, & Fletcher, 2011) and to improve overall functioning despite psychotic experiences (Bach & Hayes, 2002; Gaudiano & Herbert, 2006), anxiety (Roemer, Orsillo, Salters-Pedneault, 2008), and depression (Zettle, Rains, & Hayes, 2011; Zettle & Rains, 1989). ACT has also been applied to non-clinical populations (termed "Acceptance and Commitment *Training*"). For example, ACT Training has been applied to improve work performance (Bond & Flaxman, 2006) and to increase innovation (Bond & Bunce, 2000). ACT Training has also been shown to improve quality of life for people suffering from chronic medical conditions such as diabetes (Gregg, Callaghan, Hayes & Glenn-Lawson, 2007), chronic pain (Wicksell, Ahlqvist, Bring, Melin, & Olsson, 2008), and weight management (Lillis, Hayes, Bunting, & Masuda, 2009). In the academic setting, ACT Training has been applied to helping college students reduce depression and anxiety (Muto, Hayes, & Jeffcoat, 2011), helping with mental health stigma (Masuda et al., 2007), increasing self-esteem (Hinton & Gaynor, 2010), and reducing public speaking anxiety (Block, 2002). It may be that ACT Training would demonstrate similar success in reducing procrastination.

Applied to procrastination, ACT Training would focus on building psychological flexibility around the distress that comes with certain tasks in such a way as to increase contact with whatever is important about that task, thus increasing motivation to complete it. Linking tasks, especially aversive ones, to personal values would facilitate commitment action and increase the ability to move toward ones values. Specifically, the ACT model suggests that interventions teach procrastinators to notice what they are experiencing in the moment, defuse from dominating thoughts, enhance acceptance of experiential content, identify and shift amongst perspectives, choose personal values by which to live, and take effective action toward those values. In other words, by building a behavioral repertoire that allows for contact with painful events, procrastinators can move toward the things that are important to them, rather than avoid hard tasks by procrastinating.

Current Study

Procrastination appears to be a common, yet disruptive phenomenon that can cause stress and strain on everyday life. It is extremely prevalent, specifically in the area of academics (Ellis & Knaus, 1977; Hill, Hill, Chabot, & Barrall, 1978). Procrastination has been explored from both person- and situation-centered approaches with little development in the way of empirically-based interventions (Klingsieck, 2012). CBS offers an analysis of procrastination – as experiential avoidance, and a specific intervention approach, ACT Training for procrastination. ACT Training for procrastination focuses on building psychological flexibility around the distress that comes with certain tasks in such a way as to increase contact with whatever is important about that task, thus increasing motivation to

complete it. The purpose of this study was to evaluate ACT as an intervention for procrastination. Specific hypotheses included:

1) psychological inflexibility (values, committed action, fusion, and experiential avoidance) will predict procrastination pre-intervention, such that elevations in psychological inflexibility will predict high levels of procrastination;
2) procrastination levels will decrease following the ACT intervention such that pre-intervention procrastination levels are higher than post-intervention levels;
3) psychological inflexibility will moderate response to the intervention, such that those with greater inflexibility will demonstrate a greater decrease in procrastination than those low in inflexibility both when compared to pre-intervention levels.

Methods

Participants

Participants were freshman students enrolled in first year seminar courses (n=26) and sophomore students identified by the Academic Success Center as being on probation for not having met requirements for continued enrollment or funding (n=56). Participation was voluntary. Those in the freshman seminar courses received extra credit for participating, while those who were on academic probation were strongly encouraged to attend. In order to be eligible for the study, students needed a smart phone that provided internet access.

Eighty-two students volunteered for participation in the study. Participants identified as White (*n* = 38), Black (n= 28), Asian (n= 5), and Other (n= 11). There were forty-six females and thirty-seven males. High school GPA's were reported as 3.5-4.0 (n= 17), 3.0-3.4 (n=30), 2.5-2.9 (n=26), 2.0-2.4 (n=4), and less than 2.0 (n= 4). ACT scores were reported as 28-32 (n= 12), 24-27 (n= 9), 20-23 (n= 38), and 16-19 (n= 12). Forty-six participants attended the ACT Training. Of those 46, 32 completed sufficient reports (see description below) by EMA and 38 completed the final questionnaire packet at post. Study completers were defined as any participant who partook in the intervention and completed either the post-intervention questionnaires, the post-interventon EMA, or both.

Only 69 of the 82 participants responded to the EMA texts. There were 19 participants who missed their initial scheduled workshop, so they continued the EMA for another week until they attended the intervention. For these participants, their pre EMA intervention consisted of 2 weeks. In order to determine sufficient EMA reports, subject's

responses must have been no greater than 90% similar and responded outside of a 5-minute time frame. An inspection of scatterplots, subject by subject, indicates that 10 of the subjects did not report any change in procrastination or psychological flexibility over time. In addition there was one participant who responded using the wrong participant number. As such, these students were not included in the further analyses. The scatterplots indicated one outlier in the dataset who was also removed. The final EMA dataset consists of 860 psychological flexibility observations and 260 procrastination observations, with a total of 32 subjects.

Measures

Demographic questionnaire. Students were first given a short survey including items such as age, gender, ethnicity, major, ACT score, and high school GPA. They also identified preferred times for contact for the sampling survey as well as preferred procrastination workshop times.

Irrational Procrastination Scale (IPS). The IPS (Steel, 2002) is a 9-item self-report measure of procrastination. Statements are evaluated on a 5-point Likert scale ranging from "disagree" to "agree." Example statements include, "I spend my time wisely" and "When I should be doing one thing, I will do another." The IPS has demonstrated strong validity and reliability in a variety of adult samples (Steel, 2002), with four-month test-retest reliability at .67 (Steel, 2002). The IPS shows good internal consistency for the current sample (Cronbach's $\alpha = .90$).

Pure Procrastination Scale (PPS). The PPS (Steel, 2010) is a twelve-item self-report measure of procrastination that was created by finding the most central items across three

widely used procrastination scales (e.g. General Procrastination Scale, Adult Inventory of Procrastination, Decisional Procrastination Questionnaire) using factor analysis. The items that were selected have a reliability of .92. The PPS is based on the premise of procrastination as a harmful, irrational delay. It correlates at .96 with the Irrational Procrastination Scale (IPS), suggesting they can be used as parallel forms and sharing similar validation efforts. Statements are evaluated on a five-point Likert scale ranging from "never" to "always." Example statements include, "I waste a lot of time on trivial matters before getting to the final decisions" and "I don't get things done on time." For the current sample, the measure displays good internal consistency (Cronbach's $\alpha = .94$).

Acceptance and Action Questionnaire–II (AAQ-II). The AAQ-II (Bond et al., 2011) is a 7-item self-report measure of psychological inflexibility and experiential avoidance for adults. Statements, such as "I am in control of my life," are evaluated ranging from "never true" to "always true." High scores on the AAQ-II determine greater levels of psychological inflexibility. The AAQ-II is consistent with the original measure ($r = .97$), and the three and twelve- month test-retest reliabilities are .81 and .79, respectively. In addition, the measure exhibited good evidence of internal consistency for the current sample (Cronbach's $\alpha = .90$).

Cognitive Fusion Questionnaire (CFQ). The CFQ (Gillanders et al., 2014) is a psychometrically sound questionnaire that measures cognitive fusion and correlates strongly with other relevant measures. The measure consists 13 self-report items on a 7-point scale, labeled "never true" to "always true." The CFQ's internal consistency and test-retest reliability are good to excellent in both clinical and non-clinical samples ($r = .82$), with

very good reliability (Cronbach's α = .86);(Gillanders et al., 2014). For the current sample, the measure had good internal consistency (Cronbach's α = .93).

Committed Action Questionnaire (CAQ). The CAQ (McCracken, 2013) is a self-report measure of committed action and correlates strongly with other relevant measures. The measure consists of 24-items on a 6-point scale, labeled "never true" to "always true." The CAQ shows good internal consistency (Cronbach's α = .90) and had good internal consistency for the current sample (Cronbach's α = .84).

Valuing Questionaire-8 (VQ-8). The VQ-8 (Smout, Davies, Burns, & Christie, under review) is the short version of the VQ-20, a questionnaire that measures self-reported engagement in valued living. The VQ-8 captures variation in valued living from the psychological flexibility perspective and aims to provide inference without previous ACT exposure. The measure consists of 8 self-report items on a 7-point scale, "not at all true" to "completely true." The internal consistency for the current sample was good (Cronbach's α = .84).

Procrastination Sampling Survey (PSS). The PSS is a 9-item measure of procrastination behavior designed by the authors to be administered using Ecological Momentary Assessment (EMA), which allows for reporting in real time using a mobile electronic device, such as a cell phone. All questions from the Irrational Procrastination Scale were adapted to present time to comprise the PSS (e.g. "Today, when I should have done one thing, I did another"). The PSS showed good evidence of reliability with the current sample (Cronbach's α = .91).

Psychological Flexibility Sampling Survey (PFSS). The PFSS is an 8-item measure of psychological flexibility behavior designed by the authors to be administered using EMA. The PFSS included two questions from each of the questionnaires measuring components of psychological flexibility: AAQ-II, CFQ, CAQ, and VQ-8. All of the questions used were adapted to refer to present rather than past tense (e.g. "At this moment, it seems like most people are handling their lives better than I am."). When examining the sampling survey's internal consistency, the sampling measures were adequate. The VQ-8 questions showed low internal consistency (Cronbach's $\alpha = .39$), while the other four measures were moderate to adequate (AAQ-II : Cronbach's $\alpha = .75$, CFQ : Cronbach's $\alpha = .83$, and CAQ : Cronbach's $\alpha = .80$).

ACT for Procrastination Intervention

The ACT Training for Procrastination was a two-hour group-based intervention focusing on building psychological flexibility to reduce procrastination. Primary components of the intervention included: clarifying values, identifying obstacles preventing success, relating procrastination to the identified obstacles, using cognitive defusion techniques to distance from problematic experiences, learning experiential acceptance techniques, increasing contact with present moment, and setting effective goals towards values. Each component was introduced didactically and then explored experientially. Groups were led by an advanced graduate student with explicit training in Acceptance and Commitment Therapy and supervised by a licensed psychologist with expertise in training ACT.

Procedure

Students enrolled in the freshman seminar class were invited to participate via announcements from their instructor. Students identified as being on academic probation were invited to participate via email. Students who decided to participate were provided a link to a survey where they were asked to schedule an initial meeting to review the study protocol. At each meeting, the researcher described the purpose of the study, the tasks of the participants, risks and benefits of participation, and right to withdraw. Those wishing to volunteer were instructed to read and sign an informed consent and were then issued a random participant number.

Following consent, participants completed a packet of questionnaires including the demographic questionnaire, the AAQ-II, the CFQ, the CAQ, the VQ-8, the IPS, and the PPS. Next, participants were sent an opt-in request via text message to establish connection and consent for the EMA portion of the study. Finally, participants were provided a written copy of the consent. They were instructed to write their participation number, timeline, and workshop appointment on the sheet. The consent included contact information for the researcher.

During Phase I, participants received five text messages every day for four days at their preferred times between 10:00am and 10:00pm. Each day, the first four text messages linked participants to the PFSS, and the message sent at the end of the day linked participants to the PSS. All text messages were automated through a mass messaging system, TXT180, where all participant information was secure and confidential. In addition, surveys were administered through SurveyMonkey, a secure data collection website that

maintains confidentiality. Two days later, participants partook in the ACT Training, followed by another four days of assessments. Figure 1 illustrates participant procedures by day. Participants who were unable to attend their originally scheduled ACT Training (n = 19) continued EMA for another week and attended the following Monday.

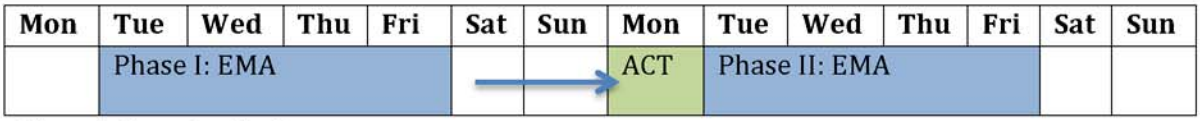

Figure 1. Procedure by Day

Results

Data Analysis Strategy

Data analysis for this study proceeded in five phases. First, questionnaire data were examined in terms of distributions of scores and correlations between procrastination and psychological flexibility variables. Dependent samples t-tests were conducted to examine changes in procrastination and flexibility from before ACT training to after. Second, EMA data were used to construct linear models by participant for both procrastination and psychological flexibility variables. Dependent samples t-tests were conducted to examine changes in procrastination and psychological flexibility rates of change from before ACT training to after. Fourth, psychological flexibility scores were averaged to create a mean score for each report day so that there were equal numbers of observations for procrastination and psychological flexibility. These means were then used to create a linear model for each participant predicting procrastination from psychological flexibility. Fifth, the data was separated by pre and post ACT Training and a two-way repeated measures ANOVA was used to examine psychological flexibility as a moderator of changes in procrastination between pre and post.

Descriptive Statistics for Questionnaire Data

Psychological flexibility. The AAQ-II is a 7-question measure of psychological flexibility. Higher scores indicate higher inflexibility while lower scores indicate higher flexibility. Scores can range from 7 to 49. AAQ-II scores for all original participants ranged from 7 to 45 with a mean of 18.78 (see Table 1). Prior to ACT training, AAQ-II scores for study completers ranged from 7 to 35, with a mean of 17.55 (see Table 2). After ACT

training, AAQ-II scores for study completers ranged from 7 to 41, with a mean of 19.36 (See Table 3). Dependent samples t-tests revealed no significant differences between AAQ-II pre and post for study completers ($t(1, 37) = 1.30$, $p = .20$).

The CFQ is a 7-question measure of cognitive fusion. Higher scores indicate higher cognitive fusion, and lower scores indicate higher cognitive defusion. Scores can range from 7-49. CFQ scores for all original participants ranged from 7 to 48 with a mean of 21.87 (see Table 1). Prior to ACT training, CFQ scores for study completers ranged from 7 to 41, with a mean of 20.58 (see Table 2). After ACT training, CFQ scores for study completers ranged from 7 to 36, with a mean of 21.08 (See Table 3). Dependent samples t-tests revealed no significant differences between CFQ pre and post for study completers ($t(1, 37) = .05$, $p = .73$).

The CAQ is a 24-question measure of committed action. Higher scores indicate higher committed action, while lower scores indicate lower committed action. Scores can range from 0 to 144. CAQ scores for all original participants ranged from 55 to 128 with a mean of 89.41 (see Table 1). Prior to ACT training, CAQ scores for study completers ranged from 62 to 128, with a mean of 91.27 (see Table 2). After ACT training, CAQ scores for study completers ranged from 69 to 142, with a mean of 97 (See Table 3). Dependent samples t-tests revealed a significant difference between CAQ pre and post for study completers ($t(1, 31) = 2.38$, $p = .02$), such that participants reported more committed action following the intervention.

The VQ-8 is an 8-question measure of valued living. Higher indicate higher valued living, and lower scores indicate lower valued living. Scores can range from 0-48. VQ-8

scores for all original participants ranged from 6 to 48 with a mean of 30.06 (see Table 1). Prior to ACT training, VQ-8 scores for study completers ranged from 6 to 48, with a mean of 30.79 (see Table 2). After ACT training, AAQ-II scores for study completers ranged from 14 to 48, with a mean of 30.95 (See Table 3). Dependent samples t-tests revealed no significant differences between VQ-8 pre and post for study completers ($t(1, 36) = .11$, $p = .91$).

Procrastination. The PPS is a 12-question measure of procrastination. Higher scores indicate higher procrastination while lower scores indicate lower procrastination. Scores can range from 12 to 60. PPS scores for all original participants ranged from 12 to 59 with a mean of 38.88 (see Table 1). Prior to ACT training, PPS scores for study completers ranged from 14 to 58, with a mean of 35.89 (see Table 2). After ACT training, PPS scores for study completers ranged from 15 to 58, with a mean of 36.16 (See Table 3). Dependent samples t-tests revealed no significant differences between PPS pre and post for study completers ($t(1, 34) = .19$, $p = .85$).

The IPS is a 9-question measure of procrastination. Higher scores indicate higher procrastination while lower scores indicate lower procrastination. Scores can range from 9-45. IPS scores for all original participants ranged from 12 to 43 with a mean of 30.77 (see Table 1). Prior to ACT training, IPS scores for study completers ranged from 13 to 43, with a mean of 30.95 (see Table 2). After ACT training, IPS scores for study completers ranged from 9 to 44, with a mean of 29.27 (See Table 3). Dependent samples t-tests revealed significant differences between IPS pre and post for study completers ($t(1, 32) = 2.16$, $p = .04$), such that procrastination decreased following the intervention.

Correlational analyses of questionnaire data. Analyses were conducted among all psychological flexibility and procrastination variables in order to explore bivariate relationships. It was predicted that scores on the AAQ-II, CFQ, CAQ, and VQ-8 would be highly correlated with procrastination such that higher levels of psychological inflexibility would predict higher levels of procrastination. As predicted, decreased AAQ-II and CFQ scores and increased VQ-8 and CAQ scores were associated with increased levels of procrastination as measured by both the PPS and the IPS (see Table 1). The pattern varied slightly for study completers, however, in that procrastination scores prior to intervention were predicted only by CAQ and VQ-8 scores. After the intervention, all four dimensions of psychological inflexibility predicted procrastination (see Table 3).

Table 1.

Summary of Intercorrelations, Means, and Standard Deviations for Procrastination and Flexibility Variables Before ACT Training (n = 82)

Measure	1	2	3	4	5	6
1. AAQ-II	--					
2. CFQ	.80***	--				
3. CAQ	-.50***	-.54***	--			
4. VQ-8	-.70***	-.68***	.56***	--		
5. PPS	.42***	.48***	-.60***	-.56***	--	
6. IPS	.29**	.38**	-.50***	-.53***	.87***	--
M	18.78	21.87	89.41	30.06	35.88	30.77
SD	8.99	10.58	16.58	9.76	12.23	7.85

*p < .05. **p <.01. ***p < .001

Table 2.

Summary of Intercorrelations, Means, and Standard Deviations for Procrastination and Flexibility Variables Before ACT Training for Study Completers (n = 38)

Measure	1	2	3	4	5	6
1. AAQ-II	--					
2. CFQ	.64***	--				
3. CAQ	-.40*	-.54**	--			
4. VQ-8	-.57***	-.55***	.51**	--		
5. PPS	.17	.31	-.60***	-.46**	--	
6. IPS	.04	.18	-.55**	-.43**	.88***	--
M	17.55	20.58	91.27	30.79	35.89	30.95
SD	6.98	9.43	15.92	8.76	11.56	8.12

*p < .05. **p <.01. ***p < .001

Table 3.

Summary of Intercorrelations, Means, and Standard Deviations for Procrastination and Flexibility Variables After ACT Training for Study Completers (n = 38)

Measure	1	2	3	4	5	6
1. AAQ-II	--					
2. CFQ	.79***	--				
3. CAQ	-.68***	-.72***	--			
4. VQ-8	-.67***	-.68***	.88***	--		
5. PPS	.64***	.65***	-.72***	-.72***	--	
6. IPS	.41*	.55**	-.62**	-.64**	.82***	--
M	19.37	21.08	97	30.94	36.17	28.27
SD	9.23	9.24	20.39	9.16	11.33	7.81

*p < .05. **p <.01. ***p < .001

Preliminary Analyses of EMA Data

Full data were collected and analyzed for 32 subjects over a two to three week period. There were 19 participants who missed their initial scheduled workshop, so they continued the EMA for another week until they attended the intervention. For these participants, their pre EMA intervention consisted of two weeks. The final EMA dataset consists of 860 psychological flexibility observations and 260 procrastination observations. An inspection of scatterplots, subject by subject, indicates that 10 of the participants gave the same response for procrastination and psychological flexibility over time. In addition there was 1 participant who responded using the wrong participant number. As such, these students were not included in the further analyses. The scatterplots indicated one outlier in the dataset who was also removed. In addition, there were 28 participants who answered multiple surveys within a five-minute time frame. Following the initial response, the

responses recorded within five minutes were removed. Once these participants were removed, there were a total of 32 subjects.

Descriptive Statistics of EMA data

Psychological flexibility. The first component of the PFSS was the AAQ-II sampling survey. The AAQ-II sampling survey consisted of two questions measuring psychological inflexibility. The two questions used were adapted to ask about the students' current context: "At this moment, my painful experiences and memories make it difficult for me to live a life that I would value" and "At this moment, it seems like most people are handling their lives better than I am." Higher scores indicate higher inflexibility, and lower scores indicate higher flexibility. Scores can range from 1-14. As seen in Table 4, the distribution of means over participants and across reports ranged from 1 to 14 with a mean of 4.65 for pre intervention. Table 5 shows distribution of means after the intervention, which ranged from 2 to 13 with a mean of 4.63. Dependent samples t –tests revealed no significant differences between pre and post intervention means ($t(1, 29) = -.73$, $p = .47$).

The second component of the PFSS was the CFQ sampling survey. The CFQ sampling survey consisted of two questions measuring cognitive fusion. Higher scores indicate higher cognitive fusion, and lower scores indicate higher cognitive defusion. The two questions were adapted to ask about the current context: "Right now, I am so caught up in my thoughts that I am unable to do the things that I most want to do," and "Right now, I over-analyze situations to the point where it's unhelpful to me." Scores can range from 1-14. As seen in Table 4, the distribution of means over participants and across reports before the intervention ranged from 1 to 14 with a mean of 4.65. Table 5 shows the scores following

the intervention, ranging from 1 to 13, with a mean of 4.47. Dependent samples t –tests revealed no significant differences between CFQ means ($t(1, 29) = -1.32$, $p = .20$) before vs. after the intervention.

The third component of the PFSS was the CAQ sampling survey. The CAQ sampling survey consisted of two questions measuring committed action. Higher scores indicate higher committed action, while lower scores indicate lower committed action. The two questions were adapted to ask about the current context: “At this moment, I prefer to change how I approach a goal rather than quit,” and “At this moment, I am able to persist with a course of action after experiencing difficulties.” Scores can range from 1-14. As seen in Table 4, of means over participants and across reports ranged from 1-14 with a mean of 10.42 prior to the intervention. Following the intervention, scores ranged from 2-14, with a mean of 10.76 (See Table 5). Dependent samples t –tests revealed no significant differences between CAQ means ($t(1, 29) = 1.54$, $p = .13$) before versus after the intervention.

The fourth component of the PFSS was the VQ-8 sampling survey. The VQ-8 sampling survey consisted of two questions measuring valued living. Higher scores indicated higher valued living, while lower scores indicated lower valued living. The two questions were adapted to ask about the participant’s current context: “Right now, I am basically on ‘auto-pilot’,” and “At this moment, I am making progress in the areas of my life I care most about.” As seen in Table 4, the distribution of means over participants and across reports ranged from 2-14 with a mean of 10.19 for pre intervention. Following the intervention, scores ranged from 2-14, with a mean of 10.59 (See Table 5). The VQ-8 sampling measure showed low evidence of reliability with the current sample (Cronbach’s $\alpha = .39$). Dependent

samples t –tests revealed no significant differences between VQ-8 means ($t(1, 29) = 1.79$, $p = .08$) before vs. after the intervention.

Table 4.

Summary of EMA Intercorrelations, Means, and Standard Deviations for Flexibility Variables before intervention (n =32)

Measure	1	2	3	4
1. AAQ-II	--			
2. CFQ	.73***	--		
3. CAQ	-.28***	-.34***	--	
4. VQ-8	-.54***	-.54***	.54***	--
M	4.69	4.69	10.38	10.16
SD	2.68	2.79	3.13	2.56

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

Table 5.

Summary of EMA Intercorrelations, Means, and Standard Deviations for Flexibility Variables after intervention (n =32)

Measure	1	2	3	4
1. AAQ-II	--			
2. CFQ	.85***	--		
3. CAQ	-.24***	-.27***	--	
4. VQ-8	-.58***	-.53***	.54***	--
M	4.71	4.52	10.74	10.51
SD	3.05	2.85	3.28	2.72

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

Procrastination. The Procrastination Sampling Survey consisted of an adapted version of the IPS. Phrases such as "Today" were added to the 9-question measure to ask participants about their procrastination for that day. Scores can range from 1 to 45. Scores ranged from 8 to 40 with a mean of 19.94 and standard deviation of 8.23 for pre intervention. Following the intervention, scores ranged from 8 to 40, with a mean of 21.03 and standard deviation of 8.64. Dependent samples t –tests revealed no significant differences pre and post procrastination means ($t(1, 28) = .03$, $p = .98$) before versus after the intervention.

Linear Modeling with EMA data

Psychological flexibility over time and between conditions. A linear growth model for psychological flexibility was specified and estimated such that each participant had an initial level of flexibility (i.e., intercept) and rate of change (i.e., slope). It was predicted that participants would show an increase in each component of psychological flexibility over time following the intervention, as evidenced by differences in rate of change (decreases after the intervention for AAQ-II and CFQ and increases after the intervention for VQ-8 and CAQ). Tests of the models are presented in Tables 6 through 9. Figures 2 through 5 present regression lines for each participant with heavy black lines representing the mean rate of change for all participants. As seen in Tables 6 through 9, none of the slopes were significantly different from zero before or after the intervention, indicating stable levels of inflexibility before and after the intervention. Also seen in Tables 6 through 9, dependent samples t –tests revealed no significant differences between slopes before versus after the intervention.

Table 6.

Parameter Estimates for Linear Growth Model of Psychological Flexibility (AAQ-II)(n = 32)

Pre					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	2.54 (.23)	11.10	<.0001*	2.07	3.00
Slope	.008 (.09)	.09	.93	-.17	.18
Post					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	1.28 (.93)	1.60	.12	-.42	3.38
Slope	.06 (.05)	1.06	.30	-.05	.17
Pre vs. Post					
		.08	.93		

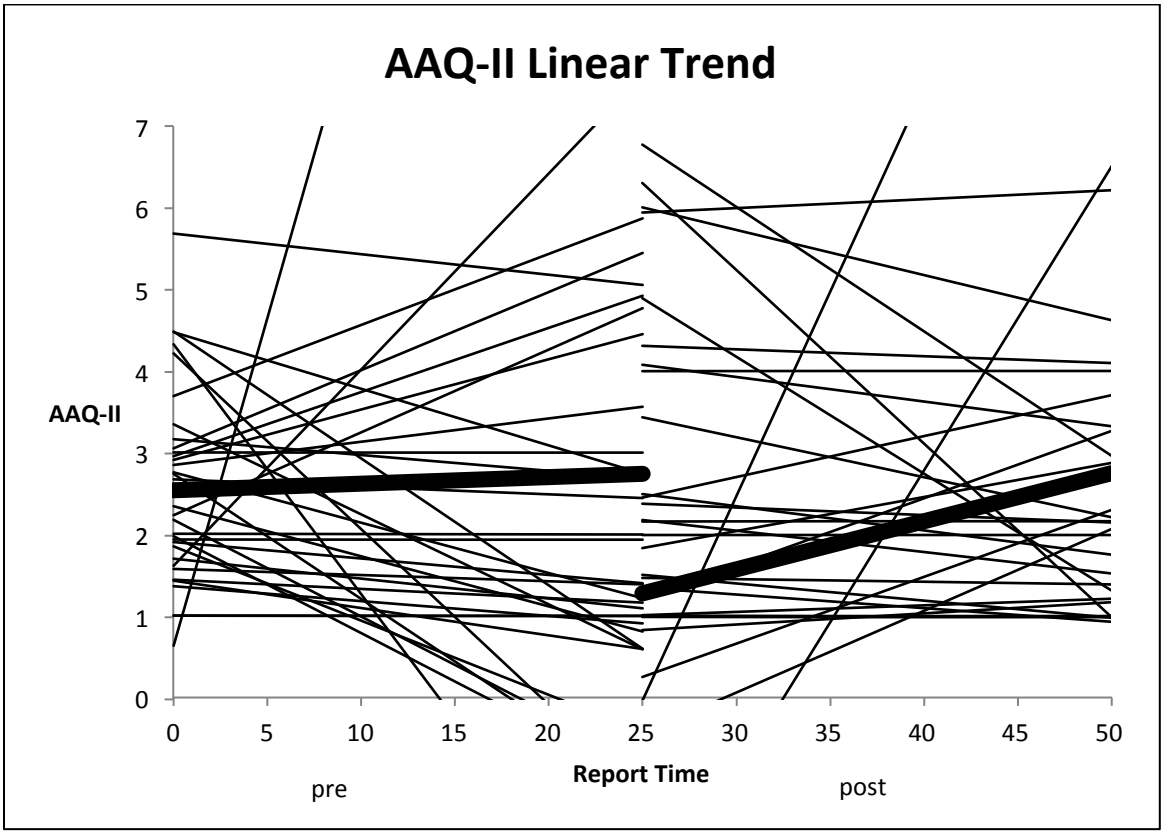

Figure 2. AAQ-II Linear Trend

Table 7.

Parameter Estimates for Linear Growth Model of Psychological Flexibility (CFQ)(n = 32)

Pre					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	2.60 (.23)	11.31	<.0001*	2.13	3.08
Slope	-.02 (.06)	-.36	.73	-.15	.10
Post					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	2.17 (.96)	2.25	.03*	.19	4.14
Slope	-.01 (.05)	-.29	.77	-.11	.08
Pre vs. Post					
		-.34	.74		

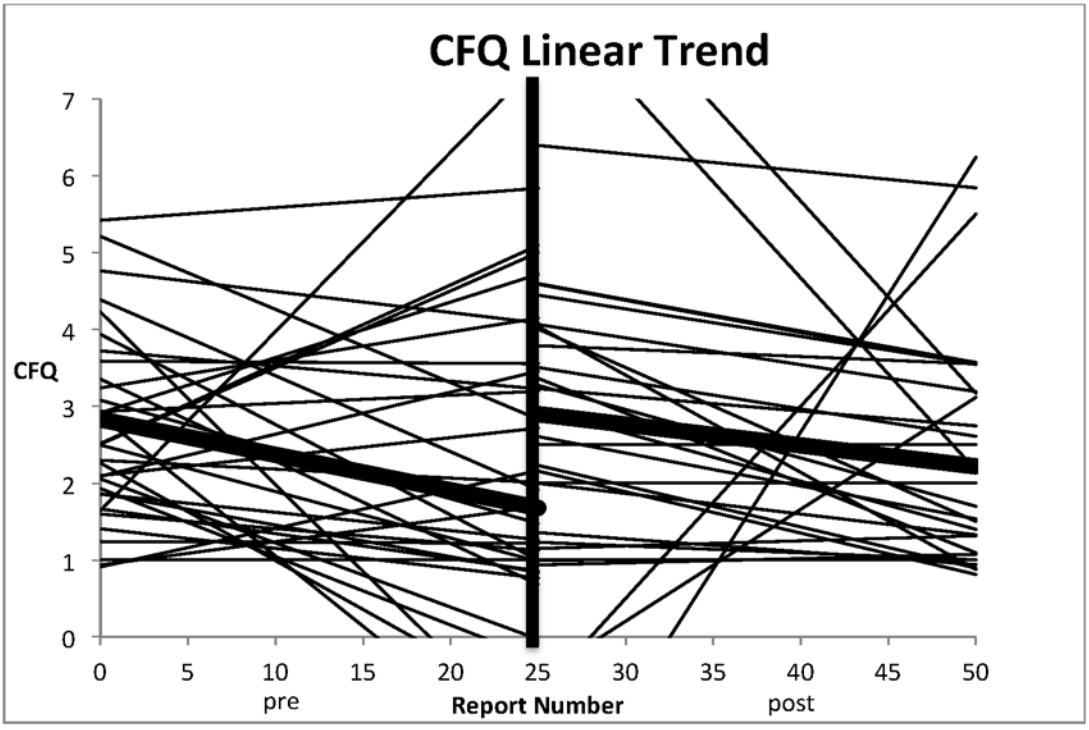

Figure 3. CFQ Linear Trend

Table 8.

Parameter Estimates for Linear Growth Model of Psychological Flexibility (CAQ)(n = 32)

Pre					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	4.93 (.24)	20.53	<.0001*	4.44	5.42
Slope	.08 (.07)	1.18	.25	-.06	.22
Post					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	5.05 (.65)	7.72	<.0001*	3.72	6.39
Slope	.01 (.05)	.21	.84	-.09	.12
Pre vs. Post					
		-1.81	.08		

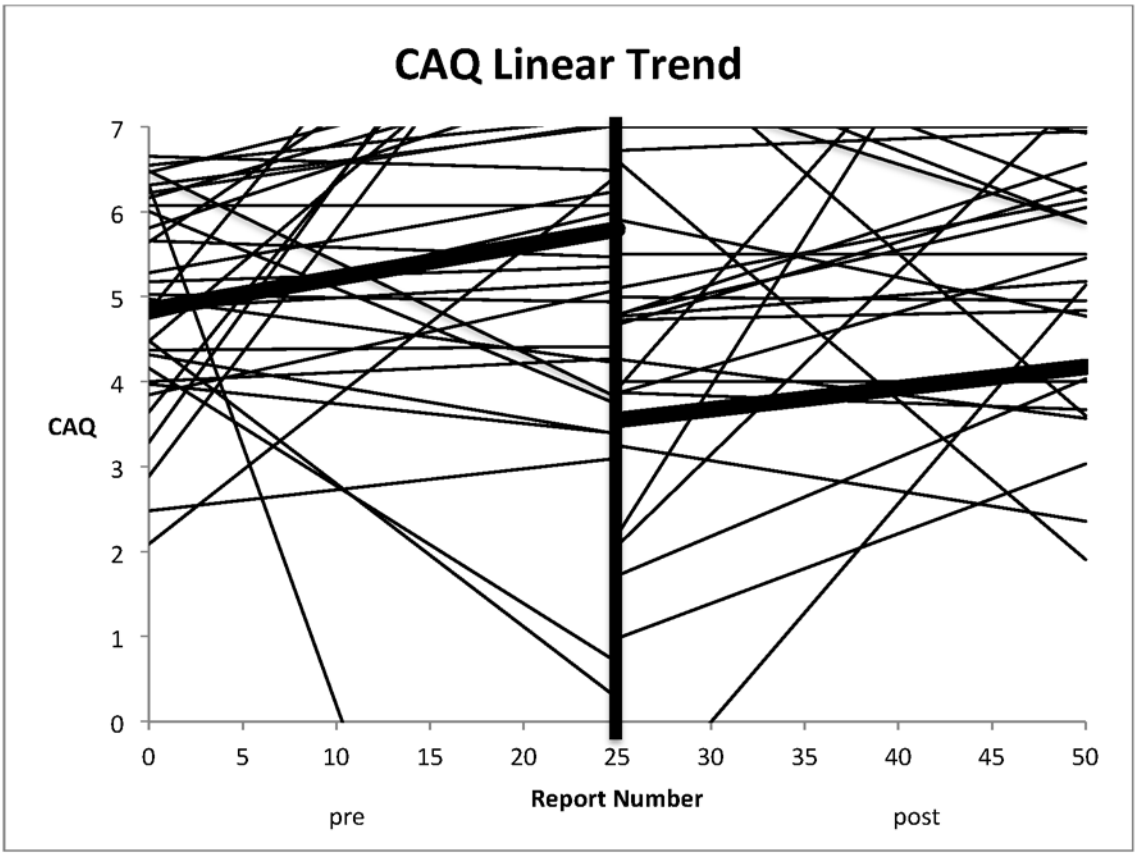

Figure 4. CAQ Linear Trend

Table 9.

Parameter Estimates for Linear Growth Model of Psychological Flexibility (VQ-8) (n = 32)

Pre					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	4.84 (.18)	26.40	<.0001*	4.47	5.22
Slope	.05 (.05)	.87	.39	-.06	.15
Post					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	7.49 (.1.57)	4.77	<.0001*	4.28	10.71
Slope	-.13 (.08)	-1.69	.10	-.30	.03
Pre vs. Post					
		-1.28	.21		

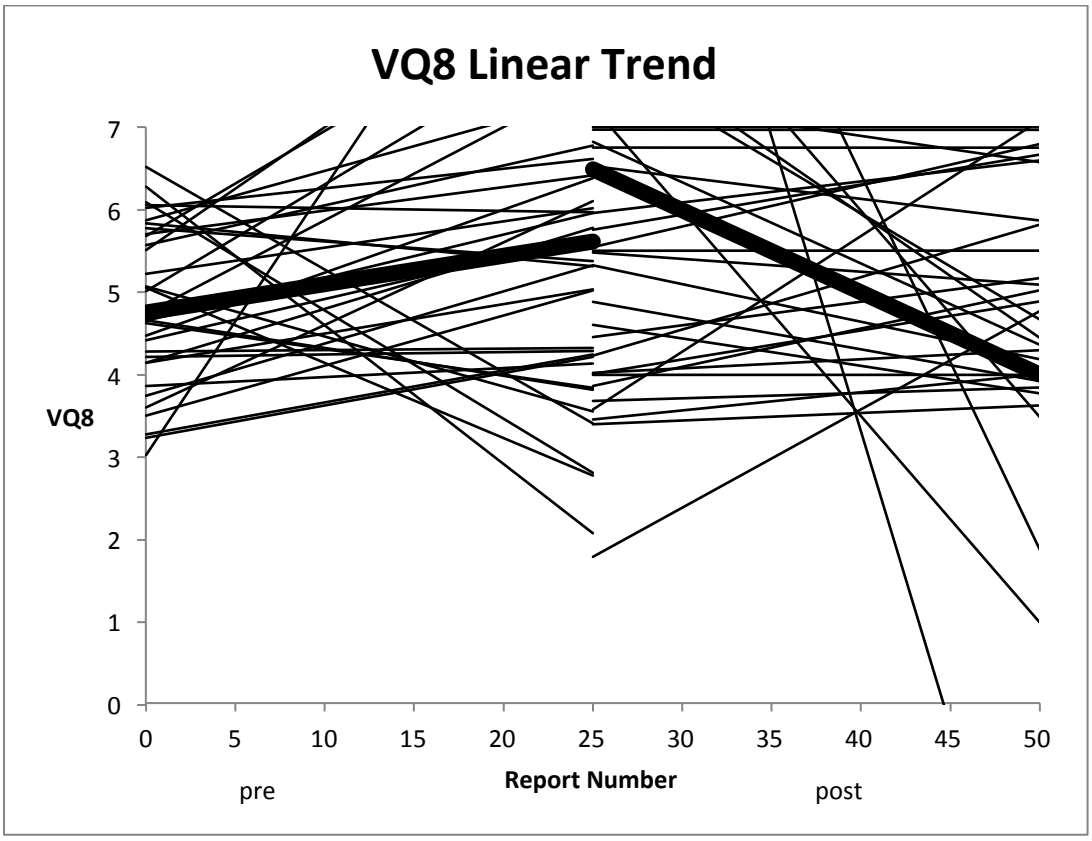

Figure 5. VQ-8 Linear Trend

Procrastination over time and between conditions. A linear growth model for procrastination was specified and estimated that allowed each participant to have their own initial level of procrastination and rate of change. It was predicted that participants would show a decrease in procrastination over time. The results are presented in Table 10 and in Figure 6 with a regression line for each participant and a heavy black line representing the mean rate of change for all participants. As seen in Table 10, the rates of change (i.e., slopes) in procrastination over time prior to intervention were significantly different from zero; however following intervention the slopes were not. When controlling for individual differences, dependent samples t-tests revealed that there were no significant differences between pre and post slopes ($t(1, 25) = -1.50$, $p = .15$), although the slope was increasing (positive) before the intervention and decreasing following the intervention (negative).

Table 10.

Parameter Estimates for Linear Growth Model of Procrastination (IPS) (n = 32)

Pre					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	2.88 (.27)	10.68	<.0001*	2.33	3.43
Slope	.03 (.06)	.49	.49	-.09	.15
Post					
				CI_{95}	
Fixed Effects	Estimate (SE)	t	p[a]	Lower	Upper
Intercept	4.31 (1.19)	3.62	.0012*	1.87	6.76
Slope	-.13 (.07)	-1.80	.09	-.28	.02
Pre vs. Post					
		-1.50	.15		

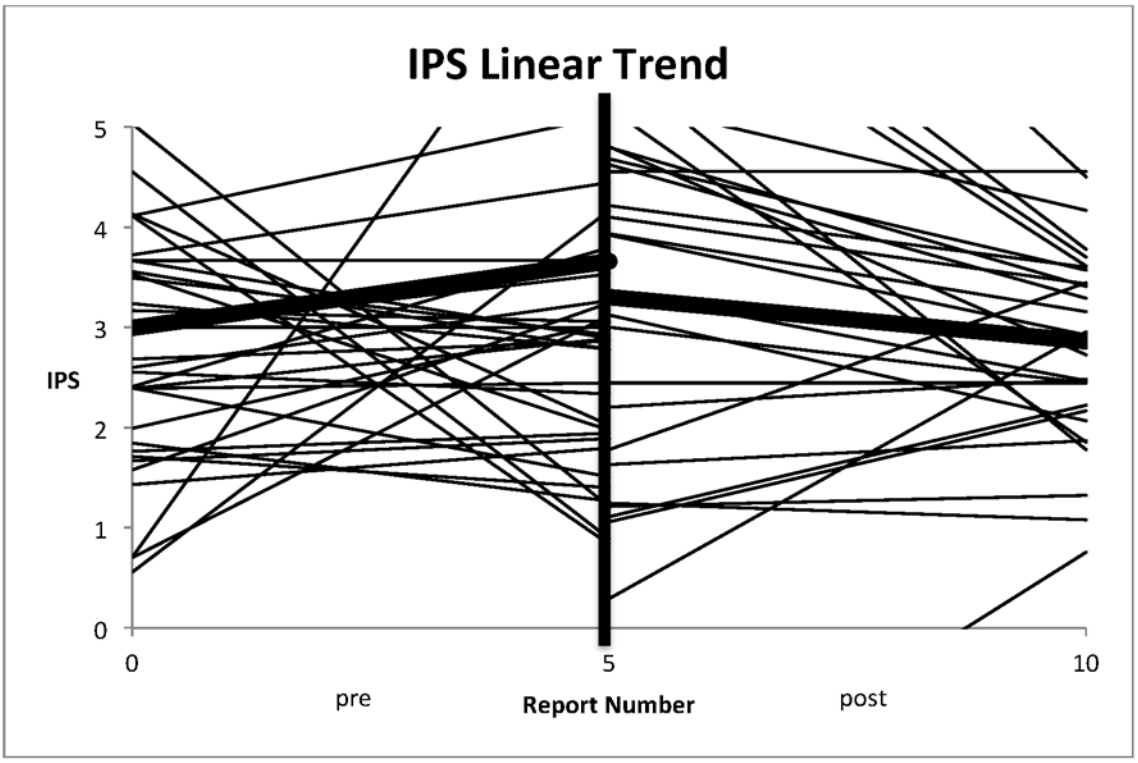

Figure 6. IPS Linear Trend

Predicting procrastination from psychological flexibility. A series of correlational analyses were conducted to examine the relationship between procrastination and psychological flexibility across all participants and reports. As seen in Tables 11 and 12, the results were similar to those with full survey data. Increases in IPS scores were associated with increases in AAQ-II and CFQ scores and decreases in CAQ and VQ-8 scores.

Table 11.

Summary of EMA Intercorrelations for Procrastination and Flexibility Variables Before ACT Training (n = 32)

Measure	1	2	3	4	5
1. AAQ-II	--				
2. CFQ	.74***	--			
3. CAQ	-.35***	-.42***	--		
4. VQ-8	-.66***	-.68***	.60***	--	
5. IPS	.48***	.40***	-.20*	-.35***	--

*p < .05. **p <.01. ***p < .001

Table 12.

Summary of EMA Intercorrelations for Procrastination and Flexibility Variables After ACT Training (n=32)

Measure	1	2	3	4	5
1. AAQ-II	--				
2. CFQ	.90*	--			
3. CAQ	-.28*	-.26***	--		
4. VQ-8	-.61***	-.53***	.59***	--	
5. IPS	.33**	.34**	-.37**	-.56***	--

*p < .05. **p <.01. ***p < .001

Linear models were constructed for each participant, predicting procrastination from psychological inflexibility. Two models were created for each participant–one for before the intervention and one for after. T-tests were used to test the slopes as significantly different from zero. As seen in Table 13, none of the inflexibility variables significantly predicted procrastination before or after the intervention. However, the slope with the CFQ score as predictor trended towards significance prior to the intervention, such

that increases in fusion predicted increases in procrastination. A different pattern was observed after the intervention. The slope with the CAQ score as predictor trended towards significance, such that increases in committed action predicted decreases in procrastination.

Table 13.

Linear Growth Model of Procrastination Predicted from Psychological Inflexibility (n = 32)

Pre					
				CI_{95}	
Variable	Estimate (SE)	t	p[a]	Lower	Upper
AAQ-II	.50 (.58)	.85	.40	-.69	1.68
CFQ	2.60 (1.47)	1.76	.09	-.42	5.58
CAQ	.24 (1.76)	.14	.89	-3.35	3.84
VQ-8	-.21 (.86)	-.25	.81	-1.95	1.53
Post					
				CI_{95}	
Variable	Estimate (SE)	t	p[a]	Lower	Upper
AAQ-II	.70 (1.20)	.59	.56	-1.77	3.18
CFQ	-.22 (1.42)	-.16	.88	-3.15	2.71
CAQ	-1.42 (.88)	-1.62	.12	-3.22	.39
VQ-8	-2.27 (1.96)	-1.16	.26	-6.31	1.76

Moderation effects. Moderation was examined in two ways. First, it was questioned whether differences in rates of change of procrastination (as measured by EMA) from before the intervention to after would vary systematically with post-intervention changes of psychological flexibility (as measured by EMA). A series of repeated measures ANOVAs were conducted comparing procrastination slopes before and after the intervention, including post-intervention psychological flexibility slopes in an interaction term. As seen in Table 14, none of the interaction effects in these models were significant, suggesting that differences

in procrastination patterns over time were not related to changes in psychological flexibility following the intervention.

Table 14.

Moderation Effects in Repeated Measures ANOVA

Variable	*F*-ratio	df	p-value
Pre/Post x AAQ-II	2.4185	1, 24	.1330
Pre/Post x CFQ	.0327	1, 24	.8581
Pre/Post x CAQ	.2773	1, 24	.6033
Pre/Post x VQ-8	1.1780	1, 24	.2885

Moderation was also examined using individual linear growth models that predicted procrastination rates of change following the intervention from psychological flexibility rates of change following the intervention. As seen in Table 15, none of these models were significant. In other words, the change in flexibility did not predict the change in procrastination following the intervention.

Table 15.

Summary of EMA test statistics for Flexibility predicting Procrastination after the Intervention

Variable	*t*	*df*	*p-value*
AAQ-II	.59	25	.56
CFQ	-.16	25	.88
CAQ	-1.61	25	.12
VQ-8	-1.16	25	.26

Discussion

Procrastination has been conceptualized as an avoidant behavior (Ellis & Knaus, 2002). However, procrastination involves not only avoidance of a task or situation, but also avoidance of experiences associated with those tasks. This experiential avoidance often results in increases in avoidant behavior and generally ineffective functioning (Hayes & Gifford, 1997). This behavior, known as experiential avoidance, is central to the psychological flexibility model (Hayes, Strosahl, & Wilson, 1999). Interventions that target experiential avoidance and, more broadly, psychological flexibility, such as ACT, may be ideal for treating procrastination. The primary purpose of this study was to examine the effectiveness of an ACT Training intervention on reducing college students' procrastination by increasing psychological flexibility. Relationships among different components of psychological flexibility and procrastination were explored.

Overall Results

Psychological flexibility and procrastination. The results of this study add support for psychological flexibility and inflexibility as relevant to academic behavior and offer a conceptualization of the psychological processes involved in procrastination. Consistent with existing research (Dionne, Carbonneau, Gangon, Marsielle, & Bélanger, 2014; Glick, Millstein, & Orsillo, 2014), this study found that students with higher psychological inflexibility were much more likely to procrastinate. In fact, for both the full survey data and EMA data, every measure of flexibility (AAQ-II, CFQ, CAQ, and VQ-8) was strongly correlated with procrastination both before and after the intervention. Students who reported high psychological inflexibility and cognitive fusion and low valued living and committed action,

also reported higher levels of procrastination. This suggests that students who are avoidant of and easily dominated by negative thoughts or feelings, such that they are unable to pursue valued choices despite these negative experiences, tend to exhibit more procrastination.

Procrastination before and after intervention. Previous literature suggests that ACT interventions within the college student population can be beneficial (e.g., Masuda et al., 2007; Muto, Hayes, & Jeffcoat, 2011). However, most of the ACT Training studies only look at psychological outcomes (i.e. anxiety, depression, stigma), rather than academic outcomes (i.e. time management, procrastination, test strategies). Recently, Scent and Boes (2014) found an increase in psychological flexibility (using the AAQ-II) following two 1 ½ hour ACT interventions, with the majority of participants reporting a decrease in procrastination. This study provided additional, though preliminary, support for ACT Training as an effective treatment for decreasing procrastination within the college population. The questionnaire data exhibited significant differences between IPS means before and after the intervention ($p < .03$) such that procrastination decreased following the intervention. There were, however, no significant differences between the means for procrastination as measured by the PPS or for procrastination as measured by EMA.

Psychological flexibility before and after intervention. For the present study, flexibility was examined using a broader range of variables (i.e. defusion, committed action, and valued living) and an additional form of assessment (EMA) rather than basic questionnaires. When analyzing the questionnaire data survey data, there were significant differences between pre- and post-CAQ ($p < .02$) questionnaires, suggesting that students

were engaging in more values-driven committed actions following the ACT intervention. There were not, however, any significant differences between the other measures of flexibility (AAQ-II, CFQ, and VQ-8) in the questionnaire data.

When analyzing the EMA data, there were no significant differences between pre and post means; however, the *p*-level for the valued living questionnaire was approaching significance (p = 0.09) such that participants were reporting higher levels of valued living following the intervention. These findings suggest that students were engaging in more valued living behaviors following the intervention. In addition, given that the difference in means for the valued living questionnaire was positive and approaching significance, and the EMA means were a nearly significant following the intervention, the results suggest that the ACT intervention had a direct effect on the student's contact with their values.

This may be partly due to the fact that the ACT intervention focused heavily on clarifying values and identifying the obstacles that prevent people from contacting their values. Many of the students were freshman that had never considered connecting school to something meaningful. In fact, many said they chose their current major either to please their parents or because they thought the major would lead to financial success. It should be noted that following the intervention, there were some students who said they were planning to change their major to one they felt was meaningful to them.

When examining the EMA slopes, there were no significant differences found between pre and post, but the p-level for the committed action questionnaire was approaching significance (*p* = .08), such that rate of change in committed action was decreasing following the intervention. However, the CAQ means indicate there was a slight,

but nonsignificant, increase in values-driven committed actions following the intervention. In addition, the questionnaire data demonstrated a significant increase between pre and post CAQ, suggesting that the ACT intervention had an effect on participants values-driven committed actions.

Psychological flexibility as a moderator. It was hypothesized that inflexibility would moderate the relationship between time and procrastination, so that students who started with greater psychological inflexibility would exhibit a greater decrease in procrastination following the intervention than those who began with lower inflexibility. It would seem that since inflexibility and procrastination are highly correlated, those who are more inflexible would have a greater change in procrastination following an intervention that targets psychological flexibility. Inconsistent with the hypothesis, none of the interaction effects in these models were significant, (see Table 13) suggesting that differences in procrastination patterns over time were not related to changes in psychological flexibility following the intervention. In addition, none of the models of were significant (see Table 14) when predicting procrastination rates of change (slopes) following the intervention from psychological flexibility rates of change (slopes) following the intervention. In other words, psychological flexibility does not seem to moderate the causal effect of an ACT intervention on procrastination.

Limitations

This study had several limitations. First, attrition and compliance were serious problems. While there were 83 participants recruited, only 46 attended the workshop, and only 32 responded sufficiently and validly to the EMA surveys. There were many factors that

may have affected attrition. Generally speaking, probation students are more avoidant and at times harder to contact, making them a more difficult population to intervene with (Smith & Winterbottom, 1970). Nineteen of the students had to be reminded or prompted through email to answer the EMA surveys, resulting in an extra week of EMA sampling for those participants. In addition, there were students who did not vary in responses throughout the entire study and students who forgot their participant number or used the wrong participant number. It may be useful to include the participant's number in each EMA text message or at least once a day if this study was replicated. Repetitive responding may also be addressed in future studies by interchanging the order of administered items. This design could reduce item-sequencing effects and improve construct validity.

There are many strengths of EMA such as capturing behavior outside of the typical laboratory setting and directly observing processes of change. In addition EMA can reduce recall biases (Tversky & Kahnman, 1982), particularly when assessing emotional experiences (Bolger & Laurenceau, 2013; Robinson & Clore, 2002). As such, it seems that EMA would be an ideal measurement for such a malleable construct such psychological flexibility. The reliability and validity of these measures, however, depends on how the items are selected. Many researchers adapt an existing measure for EMA (Shiffman, Stone, & Hufford, 2008). In addition, some suggest that multiple items are not necessary to establish reliability and that reliability can be estimated by the accumulation of single items over time (Csikszentmihalyi & Larson, 1987). In the case of this study, the two selected items from the VQ-8 that were used had a Cronbach's α of .39, indicating that the two items may not be measuring the same construct. One of the VQ-8 questions used, "Right now, I am basically on auto-pilot,"

seems to be asking about present moment behavior rather than valued living. In this case, only using two items from the measure seemed to affect construct validity and internal consistency. In the future, instead of creating a "sampling survey," the researcher might consider adapting a full survey to more accurately measure the targeted construct. A random signal-contingent design (where participants receive EMA texts at varying intervals each day) or an event contingent design (e.g., procrastination measured regarding a particular assignment).

Another, related limitation was the use of the unpublished VQ-8. The VQ-8 had to be provided by the scales' author, and in the process of publication, the author has come to revise the recommended form from the VQ-8 to a 10-question measure that uses only 6 questions from the VQ-8 (Smout, Davies, Burns, & Christie, 2014). This calls into question the validity of the VQ-8 data, and limits comparison of those results to the broader literature. This does not impact EMA data since the two sampling questions that were used are in the current Valuing Questionnaire.

A fourth limitation is that the results of this study are limited by the ability of self-report measures to adequately reflect behavior. Although self-report measures have many advantages, they are also subject to response biases as well as individual situations and moods. It has been argued that psychological flexibility may be especially vulnerable to the limitations of self-report due to context dependency (Gloster et al., 2011). The EMA sampling may have accounted for some of the variability; however, self-report is still a concern in terms of validity. For example, a student may be effective at moving towards their values and contacting the present moment while visiting with their family, but not be

particularly effective when studying for a test. However, the EMA assessed a participant's behavior across multiple contexts to reduce this effect. But even so, self-report measures may be influenced by response biases or social desirability biases or may be exaggerated. In addition, self-report data can influenced by a participant's psychopathology (Kessler, Wittchen, Abelson, & Zhao, 2000). Further studies in this area should include behavioral observations of procrastination and psychological flexibility within the college population. In particular, observing how many times they logged on to a social media website the night before a test or how many times they engaged in an avoidant behavior before an impending deadline could more clearly explain the relationship between psychological flexibility and procrastination.

Finally, the lack of a control group limits the conclusions that can be drawn from these data. It is unclear whether changes observed were attributable to the intervention or simply to the passage of time. A randomized controlled trial would allow for stronger causal inferences regarding the impact of the intervention on procrastination.

Implications and Future Directions

Despite these limitations, the current study provides a foundation for future work in the area of psychological flexibility and procrastination, both in terms of conceptualization and methodology. In terms of conceptualization, several indices converged to suggest that fusion and avoidance may be most important in predicting procrastination, while values and committed action may be most important in predicting responsiveness to an ACT intervention. Although these measures are intended to measure highly interdependent constructs in opposite directions, less inflexibility does not seem to be synonymous with

more flexibility, and vice versa. Future research might thus take care to include multiple assessments of psychological flexibility and to examine the differential impact of ACT interventions that emphasize different components of flexibility.

There was also little consistency between questionnaire data and EMA data. EMA was included as a part of the methodology in hopes of improving the validity of the data. However, there is no way to be sure whether this was accomplished. On the one hand, it could be that the lack of convergence suggests the positive outcomes indicated in the questionnaire data should be questioned. For example, perhaps the retrospective data collected by the questionnaires simply indicate that participants experienced themselves as less likely to procrastinate, when in fact they were not procrastinating less. On the other hand, it could be that the EMA data were limited in validity, as answering the same questions repeatedly may have resulted in spurious responding.

These inconsistencies suggest that researchers should continue to use multiple methods of assessing complex behaviors such as procrastination. Including behavioral indices, however, would help to elucidate which of these methods might be most effective. This might include not only event-contingent prompts in EMA, but also tracking ecologically significant academic outcomes such as grades.

Procrastination may seem harmless, but it can have surprisingly grave effects (Klingsieck, 2013; Steel, 2007). For those in college, losing funding or getting kicked out of school is no laughing matter. Procrastination has not only been linked to low grades, dropped courses, plagiarism, and cheating (Roig & DeTommosso, 1995; Rothblum, Solomon, & Murakami, 1986; Tice & Baumeister, 1997; Wesley, 1994), but also to

psychological disorders such as depression and anxiety (Solomon & Rothblum, 1984; Ottens, 1982). With procrastination estimates as high as 95% in the college population (Ellis & Knaus, 2007; O'Brien, 2002), universities should be the starting place to target procrastination interventions. Implementing ways to screen for psychological inflexibility early may be a consideration to targeting academic problems. Contacting negative experiences associated with those difficult tasks with flexibility seems to not only increase committed action and valued living, but also decrease procrastination.

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Appendix A

ACT for Procrastination Intervention

Part I. Clarifying Values Related to Being a Student: Why are you here?

- This first portion of the intervention will focus on identifying the student's own personal values and relating them to their college experience. For some, this will mean remembering why they are in college. For others, this will involve choosing a reason to be in college that they may not have had previously. Identifying values is at the core of the ACT model. Valued living is the primary purpose of ACT and provides the motivation for difficult behavior change. Establishing values related to being a student will provide participants with a purpose to consistently move towards or to return to when they get off track in school.
- Exercises: Reasons vs. Values; Sweet Spot/Stress Spot; 50th Birthday

Part II: Identifying Obstacles: What kinds of things do you do to put off being the student you want to be?

- This second portion will focus on exploring the potential obstacles that could hinder academic success. Students will be asked to write about the things that stand between them and their values related to being a student. Identifying obstacles can lead to greater awareness and allows students to acknowledge future anticipations. In addition, knowing what to expect allows students to better prepare for their obstacles. Common obstacles such as financial problems, interpersonal problems, and health problems will be explored. However, psychological problems will be the focal point.

Part III: Procrastination: Welcome to the Club

- This section will relate procrastination to the student's obstacles. Often times, students avoid tasks that are associated with unwanted feelings or experiences, resulting in little time to complete a task. Evaluating reasons for the problematic behavior is a key step in regaining control of time.

TRANSITION- What kinds of opportunities to be that person, the person you want to be, do you pass up? And why do we pass up those opportunities?

We pass up important opportunities because 1) We don't pay enough attention to notice opportunities when they arise 2) Our minds tell us these opportunities won't/can't work, 3) Taking the opportunities is hard and it is some times painful to engage in them 4) We don't love or trust ourselves enough to handle or try these new opportunities. Now we're going to explore each of these, one at a time.

Part IV: Increasing Contact with Present Moment: Observing private events as they occur

- This section will focus on enhancing conscious awareness of current experiences through mindfulness techniques. Many students struggle with focusing on a task at hand, whether that is paying attention in class, studying, or doing homework. The purpose of this mindfulness section is for students to understand that the mind always wanders, and teach them ways they can recognize when their mind is wandering and bring their focus back to the present moment. In this way, students can learn skills to increase their awareness and attention in academic settings. Teaching students how to regulate attention and focus, which promotes responding to things in their immediate environment will be explored

- Exercises: Eating a warhead, Body scan
- Think of an assignment or task you've been putting off. Now imagine what would happen if you were to suddenly begin working on the assignment or task. What kinds of thoughts, emotions, physical sensations show up? Your mind may say "I'm no good at this," "I'm going to fail," or "I'm not smart enough." Notice the evaluations or the things that show up when you imagine yourself working on that task. Notice the physical sensations in your body. Now open your eyes. Is this what usually happens to your when you get started on those kinds of tasks?

Part V: Using Cognitive Defusion Techniques: Noticing fears or worries for what they are- just thoughts

- For many students, their pattern is to avoid, avoid, avoid, until the impending deadline forces them to get started. Sometimes it is difficult to begin a task because our minds tell us we can't do it or it won't work out. However, in the grand scheme of things, our mind is only doing only what it was built to do- protect us. Many moons ago, these negative cognitions, fears, and worries kept us from danger, which helped preserve the human race. It was better to miss lunch than be lunch (Provide example). Our minds initially evolved to detect and ward off threats and later developed into a highly complex problem-solving tool. In today's world, this prediction and comparison tool can be problematic, leading to people living more in their heads rather than in engaging in the direct world around them or the present moment. This section will explore techniques that students can use to distance themselves from problematic experiences (i.e. negative cognitions, worry, fear, or

guilt). Students will be encouraged to engage thoughts only when they are useful, and to simply notice thoughts when they are not useful. The goal is for students to learn techniques to defuse and separate themselves from troublesome thoughts by evaluating the function of those thoughts rather than their content. Exercises: Noticing thoughts meditation, Label Parade

Part VI: Learning experiential acceptance techniques: What activities, people, places, and events do you stay away from to minimize unwanted thoughts, feelings, and physical sensations?

- This section of the intervention will introduce techniques to counter forms of experiential avoidance, such as procrastination, and help students move toward acceptance of aversive psychological experiences. From an ACT perspective, acceptance means opening up to all experiences whether pleasant or painful. Students will be encouraged to let go of struggling with painful mental events and make room for acceptance. The focus is on the pain associated with difficult situations, rather than the difficult situations themselves. Through acceptance, one can move closer to their chosen values and let go of avoidant behaviors that are getting in the way of valued living. Accepting imperfection will also be covered.
- Exercises: Avoidance and Workability worksheet, Tug-of-War with a Monster, Struggling with Internal Hijackers clip (http://www.youtube.com/watch?v=NdaCEO4WtDU)

Part VII: Exploring the Self: Loving and trusting ourselve

- Everyone has stories about themselves that prevent them from moving freely in their life. Some stories limit who we are, where we want to go, and what kind of student we want to be. This section of the intervention will focus on students seeing themselves as a whole person- containing all of his/her experiences. Some students may have the thought "I'm a bad student," and not engage in class activities or discussions because they identify with this thought, the thought begins to define who they are, and in a sense become the thought. From the self-as-context approach, the self is so much more than the thought, these concepts can be viewed for what they are- just thoughts, and students can learn that these thoughts are something they have rather than something defines who they are. Students will be asked to notice how these stories/concepts get in the way of their values.
- Exercises: Chessboard, "I am" vs. "I am not" activity, Name tag

Part VII: Setting effective goals towards values

- This portion of the intervention will focus on establishing the appropriate steps consistent with each student's chosen values. The students will again contact their values, and identify SMART (Specific, Measurable, Attainable, Realistic, and Time-Oriented) goals that are in service of their chosen values.

Appendix B

Demographic Questionnaires

Student Demographic Questionnaire

1. Age
2. Gender
    - Male
    - Female
3. Ethnicity
    - White
    - Black
    - Hispanic
    - Asian
    - Other (please specify)
4. High School GPA
    - 3.5 – 4.0
    - 3.0 – 3.4
    - 2.5 – 2.9
    - 2.0 – 2.4
    - Less than 2.0
5. Highest ACT score
    - 33 – 36
    - 28 – 32
    - 24 - 27
    - 20 – 23
    - 16 – 19
    - 1 – 15

Appendix C

Acceptance and Action Questionnaire–II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
Never true	**Very seldom true**	**Seldom true**	**Sometimes true**	**Frequently true**	**Almost always true**	**Always true**

1. My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2. I am afraid of my feelings.	1	2	3	4	5	6	7
3. I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4. My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5. Emotions cause problems in my life.	1	2	3	4	5	6	7
6. It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7. Worries get in the way of my success.	1	2	3	4	5	6	7

Appendix D

Committed Action Questionnaire

Directions: Below you will find a list of statements. Please rate the truth of each statement as it applies to you by circling a number. Use the following rating scale to make your choices. For instance, if you believe a statement is "Always True", you would circle the 6 next to that statement.

0 Never True	**1 Very Rarely True**	**2 Seldom True**	**3 Sometimes True**	**4 Often True**	**5 Almost Always True**	**6 Always True**

1	I am able to persist with a course of action after experiencing difficulties	0	1	2	3	4	5	6
2	When I fail in reaching a goal, I can change how I approach it	0	1	2	3	4	5	6
3	If I experience pain from something I do, I will avoid it no matter what it costs me	0	1	2	3	4	5	6
4	I can remain committed to my goals even when there are times that I fail to reach them	0	1	2	3	4	5	6
5	When a goal is difficult to reach, I am able to take small steps to reach it	0	1	2	3	4	5	6
6	I act impulsively when I feel under pressure	0	1	2	3	4	5	6
7	I prefer to change how I approach a goal rather than quit	0	1	2	3	4	5	6
8	I am able to follow my long terms plans including times when progress is slow	0	1	2	3	4	5	6
9	When I fail to achieve what I want to do, I make a point to never do that again	0	1	2	3	4	5	6
10	I approach goals in an "all-or-nothing" fashion	0	1	2	3	4	5	6
11	I get stuck doing the same thing over and over even if I am not successful	0	1	2	3	4	5	6

12	I find it difficult to carry on with an activity unless I experience that it is successful	0	1	2	3	4	5	6
13	When I make commitments, I stick to them	0	1	2	3	4	5	6
14	I am more likely to be guided by what I feel than by my goals	0	1	2	3	4	5	6
15	Pursing my goals is important to me both when this feels easy and when it feels difficult	0	1	2	3	4	5	6
16	I am able to persist in what I am doing or to change what I am doing depending on what helps me reach my goals	0	1	2	3	4	5	6
17	If I make a commitment and later fail to reach it, I then drop the commitment	0	1	2	3	4	5	6
18	I am able to let go of goals that I repeatedly experience as unreachable	0	1	2	3	4	5	6
19	I am able to incorporate discouraging experiences into the process of pursuing my long term plans	0	1	2	3	4	5	6
20	I am able to accept failure as part of the experience of doing what is important in my life	0	1	2	3	4	5	6
21	If I feel distressed or discouraged, I let my commitments slide	0	1	2	3	4	5	6
22	I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me	0	1	2	3	4	5	6
23	If I cannot do something my way, I will not do it at all	0	1	2	3	4	5	6
24	I can accept my limitations and adjust what I do accordingly	0	1	2	3	4	5	6

Appendix E

Cognitive Fusion Questionnaire

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
Never true	**Very seldom true**	**Seldom true**	**Sometimes true**	**Frequently true**	**Almost always true**	**Always true**

1. My thoughts cause me distress or emotional pain	1	2	3	4	5	6	7
2. I get so caught up in my thoughts that I am unable to do the things that I most want to do	1	2	3	4	5	6	7
3. I over-analyse situations to the point where it's unhelpful to me	1	2	3	4	5	6	7
4. I struggle with my thoughts	1	2	3	4	5	6	7
5. I get upset with myself for having certain thoughts	1	2	3	4	5	6	7
6. I tend to get very entangled in my thoughts	1	2	3	4	5	6	7
7. It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful	1	2	3	4	5	6	7

Appendix F

Valuing Questionnaire-8

Please read each statement carefully and then circle the number which best describes how much the statement was true for you DURING THE PAST WEEK, INCLUDING TODAY.

0	1	2	3	4	5	6
Not at all true						**Completely true**

1. It seems like I was just 'going through the motions', rather than focusing on what was important to me.	0	1	2	3	4	5	6
2. I continued to get better at being the kind of person I want to be.	0	1	2	3	4	5	6
3. I made progress in the areas of my life I cared most about.	0	1	2	3	4	5	6
4. I tried to work towards important goals, but something always got in the way.	0	1	2	3	4	5	6
5. Difficult thoughts, feelings, or memories got in the way of what I really wanted to do.	0	1	2	3	4	5	6
6. I was proud of how I lived my life.	0	1	2	3	4	5	6
7. I was basically on 'auto-pilot' most of the time.	0	1	2	3	4	5	6
8. My behavior was a good example of what I stand for in life.	0	1	2	3	4	5	6

Appendix G

Irrational Procrastination Scale

1----------2----------3----------4----------5

Disagree	Somewhat agree	Agree

1. I put things off so long that my well-being or efficiency unnecessarily suffers.

2. If there is something I should do, I get to it before attending to lesser tasks. (R)

3. My life would be better if I did some activities or tasks earlier.

4. When I should be doing one thing, I will do another.

5. At the end of the day, I know I could have spent the time better.

6. I spend my time wisely. (R)

7. I delay tasks beyond what is reasonable.

8. I procrastinate.

9. I do everything when I believe it needs to be done. (R)

Note: Items designated with an (R) are reverse scored.

Appendix H

Pure Procrastination Scale

1----------2----------3----------4----------5

Disagree | Somewhat agree | Agree

DPQ4 I delay making decisions until it's too late.

DPQ2 Even after I make a decision I delay acting upon it.

DPQ1 I waste a lot of time on trivial matters before getting to the final decisions.

GPS12 In preparation for some deadlines, I often waste time by doing other things.

GPS7 Even jobs that require little else except sitting down and doing them, I find that they seldom get donefor days.

GPS1 I often find myself performing tasks that I had intended to do days before.

GPS19 I am continually saying, "I'll do it tomorrow."

GPS9 I generally delay before starting on work I have to do.

AIP10 I find myself running out of time.

AIP5 I don't get things done on time.

AIP9 I am not very good at meeting deadlines.

AIP15 Putting things off till the last minute has cost me money in the past.

Appendix I

Psychological Flexibility Sampling Survey

1	2	3	4	5	6	7
Not at all true			**Somewhat true**			**Very true**

1. At this moment, my painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2. At this moment, it seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
3. Right now, I am so caught up in my thoughts that I am unable to do the things that I most want to do.	1	2	3	4	5	6	7
4. Right now, I over-analyze situations to the point where it's unhelpful to me.	1	2	3	4	5	6	7
5. At this moment, I prefer to change how I approach a goal rather than quit.	1	2	3	4	5	6	7
6. At this moment, I am able to persist with a course of action after experiencing difficulties	1	2	3	4	5	6	7
7. Right now, I am basically on "auto-pilot."	1	2	3	4	5	6	7
8. At this moment, I am making progress in the areas of my life I care most about.	1	2	3	4	5	6	7

Appendix J

Procrastination Sampling Survey

1----------2----------3----------4----------5

Disagree | Somewhat agree | Agree

Note: Items designated with an (R) are reverse scored.

1. Today, I put things off so long that my well-being or efficiency unnecessarily suffered.

2. If there was something I needed done today, I got to it before attending to lesser tasks. (R)

3. Today, my life would have been better if I did some activities or tasks earlier.

4. Today, when I should have done one thing, I did another.

5. I know I could have spent my time better today.

6. I spend my time wisely today. (R)

7. Today, I delayed tasks beyond what was reasonable.

8. I procrastinated today.

9. Today, I did everything when I believed it needed to be done. (R)

Appendix K

Consent to Participate in an Experimental Study

Title: The Role of Psychological Flexibility in Procrastination

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Description
Procrastination appears to be a common, yet disruptive phenomenon that can cause stress and strain on everyday life. It is extremely prevalent, specifically in area of academics. Low grades, dropped course, and overall poor college outcomes have been linked to procrastination. Despite the negative consequences, students continue to engage in procrastination. This may be due to the uncomfortable feelings or experiences that arise when attempting to do a task at hand, but are delayed with procrastination. We are interested in determining whether interventions focused on building flexibility with that discomfort can reduce procrastinatory behaviors. If you decide to participate, you will answer two sets of questionnaires and attend a 2-hour procrastination workshop. You will also answer 5 short surveys via a text messaging service per day over two 4-day periods to track your behaviors. These surveys will ask about your procrastination and how open you are to these experiences.

Risks and Benefits
You may feel uncomfortable reporting your procrastination activity or questions related to your feelings or experiences. Your name will not be associated with your ratings. You will provide your phone number when you fill out your initial survey and we will use your phone number to keep track of your responses without linking them to your your name. We do not anticipate any other risks. Some people feel good about participating in a project that may help us continue to develop new ways of helping people. By participating in this study, you are contributing to scientific knowledge on human behavior and emotion, which could potentially contribute to future treatment development.

Cost and Payments

The initial surveys and recording will take about thirty (30) minutes to finish, and the text messaging surveys should not take more than a few minutes to answer a piece. The workshop will be two hours long. There are no other costs for helping us with this study.

Confidentiality
We will not associate your name with your responses or surveys. The only potentially identifying information that will be on your questionnaires will be your phone number, gender, age, class, and ethnicity. Therefore, we do not believe that you can be identified from the information we collect.

Right to Withdraw
You do not have to take part in this study. If you start the study and decide that you do not want to finish, you can withdraw from the study. Whether or not you choose to participate or to withdraw will not affect your standing with the experimenter or the University of Louisiana at Lafayette in any way. The researchers may terminate your participation in the study without regard to your consent and for any reason, such as protecting your safety and protecting the integrity of the research data.

Institutional Review Board
The Institutional Review Board (UL Lafayette IRB) functions to assure that research involving human subjects is carried out in an ethical manner. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the Chair of the UL Lafayette IRB, Dr. Nicole Müller, at (337) 482-6489.

Statement of Consent
I have read the above information. I have been given a copy of this form. I also understand that I can ask any questions before I consent to participate in the study by contacting the researchers. I understand that by signing below, I consent to participate in this study.

_____
Signature of Participant Date

_____
Signature of Investigator Date

Mullen, Ashlyne. Bachelor of Science, University of Louisiana at Lafayette, Fall 2010;
Master of Science, University of Louisiana at Lafayette, Summer 2014
Major: Psychology
Title of Thesis: The Role of Psychological Flexibility in Procrastination
Thesis Chair: Dr. Emily Sandoz
Pages in Thesis: 94; Words in Abstract: 185

ABSTRACT

Ninety-five percent of college students procrastinate (O'Brien, 2002), often leading to poor grades (van Eerde, 2003) and anxiety (Rothblum, Solomon, & Murakami, 1986). People seek to avoid aversive stimuli, therefore the more aversive a situation, the more one will avoid (Steel, 2007). This includes avoidance of a task or situation, and experiences associated with that task. Rather than changing ineffective behavior, many suppress or avoid negative experiences, often resulting in ineffective functioning (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). This process, experiential avoidance, is at the core of the psychological flexibility model and is linked to psychopathology (Hayes & Gifford, 1997). Given that procrastination is an avoidant behavior, applying this model can be a useful treatment method. The current study examines the impact of a flexibility-based intervention on procrastination with college students using both EMA and questionnaire assessments. As predicted, results indicated a significant relationship between procrastination and psychological inflexibility. Following an ACT intervention, procrastination decreased, while committed action significantly increased. Moderation analyses did not indicate psychological flexibility as affecting the strength of procrastination over time. Implications for future procrastination studies using EMA are discussed.

Biographical Sketch

Ashlyne Mullen grew up in Southwest Louisiana and attended the University of Louisiana at Lafayette, where she earned a Bachelor of Science in Psychology in 2010. She graduated with a Master of Science in Psychology from the University of Louisiana at Lafayette in 2014. She will continue her studies at Kean University in Combined School and Clinical Psychology starting in the fall of 2014.