

Academic Procrastination in College Students

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Abstract

Academic procrastination has become a prevalent issue facing students, especially college-aged students. There is a large body of research investigating the reasons behind academic procrastination and why it continues to be a growing problem for students. Researchers want to understand why procrastination affects most college students when it is associated with many long-term negative implications. Following this problem, there have been several studies conducted in hopes of finding a solution to help students procrastinate less. While there has been research about possible treatment options, there has been a lack of research specifically targeting the important predictors of procrastination. In this study, we took data from 239 students from a large, private Christian university in Virginia. We conducted bivariate correlations and a multiple regression analysis between procrastination and “self” related variables such as self-efficacy, self-esteem, self-regulation, and self-forgiveness to assess which variables have the strongest correlation with procrastination to better create treatment plans. The findings of the study indicate that self-regulation had the strongest, unique inverse relationship with procrastination which can help future researchers specifically target that variable when creating treatment plans.

Keywords: academic procrastination, college students, self-regulation, self-forgiveness, self-efficacy, self-esteem

Academic Procrastination in College Students

One major problem college students face is academic procrastination (Afzal & Jami, (2018). The general population tends to struggle with procrastination, but students in particular have extremely high rates of consistent academic procrastination. Many students will procrastinate their schoolwork or studying right up until the deadline. Although students can recognize themselves that procrastination is a harmful habit, it is difficult for students to avoid. Researchers have been conducting studies in hopes of finding a solution that has long lasting effects to reduce levels of academic procrastination in students. However, it is important that researchers first determine the root cause of procrastination in order to create an intervention plan. Procrastination can be seen as a failure of self-control, which can encompass many different variables concerning the self-including: self-compassion, self-forgiveness, self-esteem, self-efficacy, and self-regulation (van Eerde & Klingsieck 2018). Diving deeper into these variables could help explain someone's tendency toward procrastinating. So far, researchers have used acceptance and commitment therapy (ACT), cognitive behavioral therapy (CBT) and various technological interventions as possible treatment plans but are lacking in determining the correct predictors to evaluate which solution would be most successful. By focusing on examining and analyzing the variables that can influence someone's tendency to procrastinate, it can help draw better conclusions as to the reasoning behind the behavior to create more effective solutions or treatment plans. The aim of this study is to be able to more clearly define which predictors of procrastination have the most influence, so researchers can use that information to implement more successful plans.

Procrastination as a Problem

Negative Impacts

Academic procrastination can be described as the voluntary delay of intended course work despite knowing and expecting that the negative consequences will outweigh the short-term pleasure (Gagnon et al., 2019). Up to 50% of college students say that they procrastinate consistently and problematically, while up to 90% of college students have reported that procrastination has been a problem for them (Eckert et al., 2016). Procrastination is a major problem college students face because they can easily get distracted by their friends, part-time jobs, social media and other pleasurable activities. College students will spend about over 30% of their daily activities engaging in behavior like napping, watching television or playing video games (Lukas & Berking, 2018). Many consequences of procrastination include negatively affected grades, emotional and physical well-being, sleep related problems, illness, anxiety, anger, dissatisfaction levels, and exhaustion levels (Gagnon et al., 2019). It is important that researchers are able to find an intervention plan that will have long lasting effects in reducing levels of procrastination. The behavior of procrastination is highly undesirable, but it still has shown to be a hard habit to break and difficult behavior to create a treatment plan.

Reasoning

Procrastination continues to be a prevalent issue for many reasons. Treating procrastination is difficult because interventions need to be focused on the individual since the amount someone procrastinates is mostly due to their personality (Glick et al., 2014). However, generally main reasons for academic procrastination have been a fear of failure, task aversiveness, and lack of psychological inflexibility or emotional regulation (Glick et al., 2014). A study by Glick et al. (2014), showed that students with trait anxiety and low psychological

flexibility reported more feelings of task related anxiety and fear of unwanted negative emotions such as frustration, which lead to higher rates of procrastination; however, students who were able to accept their feelings and were able to regulate their emotions were less likely to procrastinate. Afzal and Jami's (2018) study found that task aversiveness or evasiveness was the most prevalent reason for academic procrastination. The more aversive someone finds a task the more likely they are to procrastinate. These aversive emotional states make someone more susceptible to the temptation of comfort or pleasure from a distraction such as a phone. Time management skills, a tendency for laziness, indecision, organizational ability, self-regulation and self-efficacy are all factors that can predict academic procrastination in a person (Afzal & Jami, 2018). People who described themselves as goal-oriented showed less levels of procrastination. In their study, they described procrastination as a complex interplay between cognitive and behavioral components (Afzal & Jami, 2018). When acknowledging several looming tasks, someone can easily feel overwhelmed and decide to put off completing those tasks, so it is essential that researchers develop an intervention that will have lasting effects. While all these factors are important overarching themes for the reasoning behind procrastination, it is important to look at the individual as procrastination can be seen as a stable personality trait (Zacks & Hen, 2018). In Zacks and Hen's (2018) research they acknowledge external and internal conditions that could trigger the behavior, but they see procrastination as something in a person's nature. They view procrastination from the differential psychology perspective. In this way, procrastination as a personality trait has certain emotional traits tied to it like negative thoughts, low achievement goals, self-esteem, poor goal management abilities and self-regulation (Zacks & Hen, 2018). As the literature shows, there can be many reasons as to why someone procrastinates.

The Effect of Emotional Regulation on Procrastination

Anxiety

Negative repetitive thoughts that cause rumination and worry such as anxiety have been linked to procrastination. Not only does procrastination lead to feelings of anxiety, but feelings of anxiety can also lead to someone's decision to procrastinate. In a study by Constantin et al. (2018), they studied how these negative thoughts correlate with procrastination. They found that the students who indicated they were experiencing high levels of anxiety and fatigue were more vulnerable to procrastination as a result of these negative repetitive thoughts. These negative cognitions that students were having was linked to procrastinatory behavior, which is why they suggested counseling services to focus on these automatic negative thoughts as a treatment plan. Their study showed the power of one's emotional status and how that can majorly affect their behaviors.

Saplavska and Jerkunkova's (2018) study tested specifically at the relationship between anxiety and procrastination to determine if there was a significant correlation there. They found that there were three main areas of research on procrastination which include the behavioral perspective, cognitive approach and individual features, which is one of the reasons why they conducted their study was to see if the cognitive approach would hold weight. In their study they found that there was a significant correlation between academic procrastination and personal and situational anxiety. They found that the bad connotation that comes along with procrastinating lead to more levels of stress and that students would procrastinate more with long deadlines, long-term assignments, and doing routine assignments (Saplavska & Jerkunkova, 2018). The reason being because of the negative feelings they had towards the assignments and their ability to get it done, which became a cycle of negative thoughts leading to procrastination which led to

anxiety which looped back around to negative thoughts. Being able to link procrastination and anxiety helps further demonstrate that procrastination is not just a behavioral problem, but it is rooted in one's emotional processes.

Emotional Regulation

The effects of emotional regulation on procrastination come from two sides: one being as viewing procrastination as a result of a failure of emotional regulation and the other being that emotional regulation is a strategy that provides people with short-term mood repair, and it is labeled as procrastination (Pychyl & Sirois, 2016). Emotional regulation includes feelings of self-control and being able to process one's feelings. Failure of emotional regulation is tied to a failure of self-regulation which is one of the predictors for procrastination (Pychyl & Sirois, 2016). In Pyschyl and Sirois' study (2016), they wanted to test different mood groups and see if people who were in bad moods and had less control over their emotional regulation skill then had a hard time with self-regulation therefore procrastination. They found that people in bad moods did spend more time procrastinating and doing alternative tasks (Pychyl & Sirois, 2016). Procrastination was viewed as a maladaptive emotion focused coping strategy wherein the people in a bad mood did not want to further escalate their distress by giving in and avoiding the task or doing another task to feel good. The study argued that emotions and how one feels towards themselves play a significant role in procrastination. People will regulate their emotions to promote pleasure and prevent pain and one way they do so is by procrastinating.

“Self” Variables (Self-Efficacy, Self-Esteem, Self-Regulation, Self-Forgiveness)

Self-handicapping has been used to describe someone who creates or claims that there are obstacles in their way to have a successful performance, but when in reality it is a defense mechanism used to protect the sense of self-competence. Barutcu and Demir (2020) believe that

self-handicapping is a part of why people procrastinate because then people can choose to cover up their failures instead of facing the real issue which is lack of motivation and drive which comes from poor self-esteem. People dislike when their ego is threatened, which is part of the reason why when people procrastinate, they tend to blame external sources instead of looking at themselves as the problem. In their study they wanted to determine if one's level of self-esteem could predict how likely they were to self-handicap when faced with the completion of tasks. They found that procrastinators will protect their self-esteem by self-handicapping and that if students could gain more awareness of their tendency to create or claim obstacles could create higher levels of procrastination (Barutcu & Demir, 2020).

Van Eerde and Klingsieck (2018) examined how self-regulation affects procrastination. They viewed procrastination as a voluntarily delay in of intended work or course of action despite expecting to be worse off for the delay, which they called a self-regulation failure. The study observed three phases of self-regulation: the pre-actional phase, actional phase, and post-actional phase. The pre-actional phase would include things like observing missing self-determination, problems planning and prioritizing. The actional phase was associated with problems concentrating on the task at hand and not shielding distractions. The post-actional phase included then feelings of low self-efficacy which they saw as a predictor for self-motivation for the next pre-actional phase. From breaking down self-regulation into these three parts, they found that within these parts there were cognitive deficits specific to each phase. They also saw that if someone procrastinates in one domain in life it was highly likely that they would procrastinate in other domains. Their solutions they sought after were training self-regulatory skills through time management, control techniques, goal definition, and organizing social support by being in a group setting.

Sirois (2014) explored the idea of self-compassion with procrastination and stress overtime. Self-compassion is the idea of being forgiving and graceful towards oneself when mistakes emerge. Instead of being overly harsh and critical with oneself, it is important in the growth process that there be some grace for mistakes. Sirois (2014) theorized that by promoting self-compassion it could benefit people who feel high levels of stress and procrastination. He saw how researchers have been linking the intrapersonal processes of negative self judgements with procrastination and wanted to take a kind stance toward oneself rather than being harshly self-critical in hopes that it will help gap the bridge between procrastination and negative thoughts (Sirois, 2014). In his study, he wanted to look at the procrastination stress relationship because he believed it would be essential for the development of interventions (Sirois, 2014). His results showed that there were lower levels of self-compassion when a student reported high levels of procrastination. Many of the students cited fear of failure as a reason as to why they put off their work or doing a task, which is why the introduction of self-compassion is important so people can be more accepting of when they fall short and forgive themselves in the process to prepare for the next situation.

Similar to self-compassion is the idea of self-forgiveness. Martincekova and Enright (2018) wanted to examine the relationship between self-forgiveness and procrastination. In the past, self-forgiveness has been related to lower distress and improved mental health, so they wanted to specifically apply the concept of self-forgiveness to procrastination (Martincekova & Enright, 2018). Self-forgiveness in relation to procrastination was broken down into two variables in this study which were guilt-proneness and shame-proneness. Their study consisted of 217 university students who completed an online assessment about these four variables. They did a correlational analyses and their results found that there was a positive relationship between

shame-proneness and procrastination, and overall higher levels of self-forgiveness was associated with lower levels of procrastination (Martincekova & Enright, 2018). They came to the conclusion that an individual who forgives themselves for their procrastination might be more motivated to accept responsibility and to avoid this behavior so therefore procrastinate less. By increasing self-forgiveness people are internally increasing positive emotions and when people feel more positively procrastination tends to be reduced (Martincekova & Enright, 2018). This study provides an interesting perspective on another variable to target when looking at why an individual chooses to procrastinate and how the cycle of procrastination can be perpetuated. Conducting further research on self-forgiveness could be beneficial to understanding if targeting this specific variable would be helpful in creating treatment plans or education tools.

Hajloo (2014), along with Blouin and Pychyl (2017) in a different study, examined self-efficacy and self-esteem in terms of procrastination. Self-efficacy and self-esteem can sound like similar traits; however, self-efficacy is someone's belief that they have the ability to exert control over their behavior and performance, while self-esteem is someone's belief about how we value and perceive ourselves in general. Hajloo (2014) viewed procrastination as a self-protective strategy to mask fragile self-esteem. He wanted to look at the relationship between procrastination, self-efficacy, and self-esteem to see what significant predictors of each other were. He took on the self-efficacy theory perspective which believes that how people think of themselves strongly influences task choice, level of effort, and persistence. From his study, he found that by targeting procrastinators through reinforcing self-efficacy helped lower procrastinating tendencies and it showed better results when paired with raising self-esteem (Hajloo, 2014). Blouin and Pychyl (2017) tested how they could increase future self-continuity to reduce procrastination. They theorized that if someone was able to develop a sense of self and

maintain a steady sense of identity when faced with the decision of making the present self feel good and the future self feel bad, they would choose making the future self feel good.

Procrastination has been linked to impulsivity and people who procrastinate have been known to have external locus of controls, which is why they thought increasing self-efficacy in their steady sense of identity would help decrease procrastination (Blouin & Pychyl, 2017). By using mental imagery to promote pro-social behavior, they were trying to foster a vivid and empathetic connection to their future self. They found that dynamic construction of their future result would encourage adaptive decision making in the present to procrastinate less and take on more responsibility (Blouin & Pychyl, 2017). These studies show how much the mind and the internal dialogue affect someone's outward behaviors. By targeting these self traits, people are able to feel more in control and can feel the proper internal motivation.

Current Possible Treatment Plans

Three main areas of current possible treatment plans to help reduce procrastination include: acceptance and commitment therapy, cognitive behavioral therapy, and technology-based treatment. Researchers have implemented and analyzed these different solution ideas, so it is important to discuss these options to see which plans are successful and which ones are lacking (van Eerde & Klingsieck 2018). By looking at the treatment plans weaknesses, people can see where further research needs to be done in finding the strongest predictors of procrastination. Once there is a clearer picture of what we can anticipate to be potential and better solutions, then we can also more readily target the significant self-related variables. Within these treatment plans and from these being what psychologists most readily use, researchers have seen links to what makes these treatment plans most useful for people is when they target those specific predictor variables of the self. It is of equal importance to then look at these treatment

plans to determine and gather information about what variables influence procrastination and someone's positive or negative response to the implementation of these treatments.

Acceptance and Commitment Therapy as Treatment Plan

Acceptance and commitment therapy (ACT) is an approach that incorporates mindfulness and acceptance processes into behavior change strategies. The goal is to increase psychological flexibility, which means to choose to perform certain actions even while feelings unpleasant emotions and feelings (Scent & Boes, 2014). In Scent and Boes' (2014) research, they found that people who were intrinsically motivated had lower levels of procrastination, while people who had weak impulse control, lack of persistence and work discipline, and lack of time management skills were extremely to procrastination. If a student perceived that the benefit, they would receive immediately by delaying their work outweighed the long-term benefit, they would choose to procrastinate (Scent & Boes, 2014). They used an ACT framework to target cognitive, behavior and motivational triggers. Part of their intervention plan is to have a workshop teach a three-step process for responding to procrastinating behavior which was to insert a mindful pause, accept and defuse emotions, and then choose to act. In this way, students can interrupt the cycle of procrastination and find underlying values and meaning in their work (Scent & Boes, 2014).

In another study by Glick and Orsillo (2015), they saw procrastination as a result of anxiety, and they wanted to use ACT to enhance psychological flexibility to encourage engagement in education, mindfulness, and value articulation. They thought by separating thoughts and feelings of school and identity it would help students be able to push through negative thoughts or emotions when it comes to schoolwork. Being aware of emotional triggers and being able to persevere through those negative feelings would help reduce levels of

procrastination. The results found that there was a statistically significant interaction between the intervention and a rise in academic values which led to less self-reported levels of academic procrastination (Glick & Orsillo, 2015). While acceptance and commitment therapy try to directly target maladaptive emotions and behaviors, cognitive behavioral therapy focuses on targeting surface level symptoms like unhealthy behavior habits or irrational beliefs.

Cognitive Behavioral Therapy as Treatment Plan

The primary form of treatment for procrastination has been cognitive behavioral therapy (CBT), which targets irrational beliefs, like underestimating time needed for assignments and overestimating future motivation levels, and maladaptive behavior like poor time management (Wang et al., 2017). CBT typically helps students with their adaptability by enhancing student's time-management skills and regulating emotions. However, due to the nature of CBT mainly focusing on "surface factors" associated with procrastination the results of using it usually only led to short term benefits because it does not help with increasing self-efficacy or learning motivation (Wang et al., 2017).

In a study performed by Toker and Avci (2015), they focused on using CBT to replace irrational beliefs with rational ones. They conducted a CB based psycho educational program to improve student's basic skills at overcoming procrastination. The program itself focused specifically on three aspects which were false thoughts, intermediate beliefs and core beliefs. The hope was to get the participants to first realize their negative emotions, then alter their negative thoughts and manage their procrastination by replacing them with functional behaviors (Toker & Avci, 2015). By employing a motivated mindset of starting work now instead of thoughts of doing it later, that helped students change into have a goal-oriented mindset and increased their emotional resilience. The experimental group in the study stated that the program

helped them change their automatic negative thoughts into confident thoughts about success. They also stated that by changing their thought process, it allowed them to better manage short- and long-term goals because they understood that by postponing their impulse and desires, they could easily achieve their personal goals of getting work done. Overall, it was reported that participants began initial studying, had an increase in intrinsic motivation, developed time management skills, and were able to better handle challenges (Toker & Avci, 2015).

The Use of Technology as Treatment Plan

Using technology as a form treatment, has many benefits that the other two forms of treatments cannot meet. The other forms of intervention can be costly and busy students may not seek out treatment in person. However, using internet-based or smartphone-based treatment plans are a new and creative way to reach students which are also cost effective and can reach more students (Gagnon et al., 2019).

Internet-Based

In Gagnon et al. (2019) pilot study, they used an internet-based form of acceptance and commitment therapy as an intervention for college students. The purpose of the study was to determine if a web-based ACT intervention had significant results in reducing academic procrastination. The researchers believed that with the combined efforts of the ACT framework with an online platform that it would have positive effects. In the study, the intervention consisted of receiving information about ways to combat academic procrastination and different exercises that helped consolidate their work (Gagnon et al., 2019). The results of the study showed that students enjoyed the online platform that the intervention was given, which made the intervention more effective. The findings reported that task persistence in students increased 34% and there was a decrease in impulsive decision making by 35%, which supports the idea

that ACT based interventions promote behavioral change (Gagnon et al., 2019). In another study by Kuchler et al. (2019), they also conducted a study that looked at the effects of an internet-based intervention for procrastination in college students. Their focus in their intervention was to target the interaction of four factors which were the value of the outcome, expectation of achieving the outcome, timing of the outcome, and individual ability to delay gratification (Kuchler et al., 2019). Over the course of five weeks participants were instructed to complete a module that helped them learn about their working behavior and encouraged them to make changes, so they were able to study more effectively and increase productivity in working sessions (Kuchler et al., 2019). These modules were fixed because they were designed to have weekly improvements. The findings of the study did prove that internet-based interventions were comparable to face to face therapy, was cost effective and eliminated barriers such as waiting times.

Smartphone-Based

While internet or web-based interventions plans have proven to be equally or more effective than face to face interventions, smartphone apps could have more benefits than computer-based treatments. Smartphone apps are equally as cost effective, scalable, patient friendly as internet-based interventions, and additionally are constantly available no maintenance cost, and are mostly owned and known how to use (Lukas & Berking, 2018). The purpose of their study was to use approach-avoidance training, computer gaming principles, and operant conditioning in their app to reduce levels of procrastination. Their app targeted user's motivations and promoted change of attitudes, incorporated a game aspect by giving users five stars, and provided immediate feedback for the user. The findings showed that the intervention group reported a significantly greater reduction of general and academic procrastination than the

control group and that these results stayed consistent for over a one-month period after the treatment (Lukas & Berking, 2018). Smartphone-based intervention plans need to be further researched but have shown promising results.

Another intervention that utilized a smartphone was based on short message service technology, which essentially are text message reminders. A study performed by Davis and Abbitt (2013) wanted to reduce procrastination via frequent text message reminders to students' mobile phones. These reminders were set to help students decrease their procrastination levels and increase their performance on quizzes and course content. The researchers thought that a combination of behavioral and cognitive strategies was needed to target procrastination as they thought of procrastination as a problem of executive functioning (Davis & Abbitt, 2013). They wanted the text messages to encourage intrinsic motivation as well as effort regulation because only by completing the required tasks could they terminate the delivery of the text message reminders. The messages were sent between 10am and 10pm every day with more messages being sent closer to the deadline. Participants characterized the experiences as something good because they felt like their instructors cared about them and believed that the reminders had a positive effect on procrastination, performance, and overall self-regulation skills (Davis & Abbitt, 2013). Overall, the system appeared to be most effective during the initial stages of its implementation and then after students got accustomed to it because less impactful; however, this study shows that there should be more research done in using technology, especially smartphone based, interventions.

Gap in the Literature and Research Question

From the literature, researchers can see that there are many different approaches to treating this problem based on the various variables influencing a person's level of

procrastination. It is also apparent that most research surrounding the topic of procrastination has solely focused more on the treatment aspect of it rather than predicting which variables contribute the most to one's tendency to procrastinate. While there have been several studies that discuss possible predictors of procrastination and detail different forms of interventions plans, there is research lacking that examines solely the correlation of all of the different self-regulatory emotions and procrastination specifically. Studies such as Pychyl and Sirois (2016) and Barutcu and Demir (2020) will look at one factor such as self-regulation or self-efficacy, but there is not much research that gathers a multitude of variables together to discuss and try to find connections between them and procrastination. It is important that more research clearly identifies which predictors correlate to one's level of procrastination. If researchers are more able to pinpoint specific predictors, then the interventions that follow would hopefully be more successful. Through a comprehensive understanding and determination of what factors lead to someone's level of procrastination, teachers, counselors, and coaches can create individualized treatment options. In this study, I decided to look at how self-efficacy, self-regulation, self-forgiveness, and self-esteem correlated with procrastination. Some research questions that arose were: 1. out of the "self" related variables which ones significantly predicts procrastination, 2. does each variable uniquely explain procrastination, and 3. which one stands out as the strongest predictors when compared to other variables. These questions are what is going to drive the data collection and analysis. My hypothesis before running the study is that all of the variables will have an effect on levels of procrastination, and that self-regulation or self-efficacy will most likely have the most significant impact on procrastinatory tendencies.

Method

Participants and Procedure

The participants consisted of an anonymous sample of 239 undergraduate college students at Liberty University who were taking a psychology course. Participants accessed the anonymous online survey by checking the department website that listed available research participation opportunities for a psychology activity credit. The participants voluntarily, by choice, took part in a five-part comprehensive survey about procrastination, self-regulation, self-efficacy, self-esteem, and self-forgiveness. IRB approval was obtained prior to conducting the survey. Consent was obtained through the first page of the online survey that contained detailed information about the study. For those who agreed to participate in the study, they answered demographic questionnaire confirming they were above 18 years of age. To avoid any potential of order effect, all of the measures were presented to the participants in random order. No identifying information about the participants was collected other than being a male or female student at Liberty University enrolled in a psychology course and above 18. All of the participants received psychology activity credit for participating.

Measures

Lay's General Procrastination Scale

Lay's General Procrastination Scale (Lay, 1986) is a five-point scale (from extremely uncharacteristic to extremely characteristic) used to measure the habits and characteristics of people when it comes to procrastinatory behavior or not. An example of a statement is, "In preparing for some deadline, I often waste time by doing other things" (Lay, 1986). Participants filled out a 20-item survey measuring statements they would use to describe how characteristic or uncharacteristic of them, which all centered around the theme of procrastination. Half of the

statements were reverse coded to ensure that participants were carefully answering each question to the best of their ability. After reverse coding all negative items, the higher the score meant the more characteristic of someone it was to procrastinate. The total scores ranged from 20-100. In this sample, internal consistency reliability was high, with an alpha of .897.

Rosenberg Self-Esteem Scale

Rosenberg Self-Esteem Scale (Rosenberg, 1965) tests how people rank themselves according to certain statements using a 4-point scale (from strongly agree to strongly disagree). Participants filled out a 10-item survey that measures self-worth by looking at both positive and negative feelings about the self. This scale is believed to be unidimensional and are differentially related to self-esteem. An example of a statement is, “I feel that I’m a person of worth, at least on an equal plane with others” (Rosenberg, 1965). Half of the statements were reverse coded to ensure that participants were carefully answering each question to the best of their ability and paying attention to what the question was asking. After reverse coding all negative items, the higher the score indicate higher self-esteem. The total scores range between 10 and 40. In this sample, internal consistency reliability was high, with an alpha of .868.

General Self-Efficacy Scale

General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) uses a 4-point scale (from not at all true to exactly true) that measures how participants rank themselves on certain statements. Participants filled out a 10-item survey that measures self-efficacy, which can be thought of as one’s belief that they have the ability to exert control over their motivation, performance, and behavior. An example of a statement is, “I can remain calm when facing difficulties because I can rely on my coping abilities” (Schwarzer & Jerusalem, 1995). There were no negatively worded items on this scale, therefore nothing had to be reverse coded. The

total scores range between 10 and 40, with a higher score indicating more self-efficacy. In this sample, internal consistency reliability was high, with an alpha of .850.

Short Form Self-Regulation Questionnaire

Participants filled out a 31-item survey that is a condensed version of the 63-item Self-Regulation Questionnaire (Brown et al., 1999). Self-regulation is seen as the ability to develop, implement, and in a timely manner achieve one's goals. The Short Form Self-Regulation Questionnaire measures one's ability to do so by using a 5-point scale (from strongly disagree to strongly agree) and specific statements about one's behavior. An example of a statement is, "When I'm trying to change something, I pay a lot of attention to how I'm doing it" (Brown et al., 1999). Half of the items were negatively worded to ensure that participants were paying attention to the statement and answering to the best of their ability. After reverse coding all negative items, the total scores range from 31-155 with the higher the score indicating high self-regulation capacity. In this sample, internal consistency reliability was high, with an alpha of .916.

Enright Self-Forgiveness Inventory

Participants filled out the Enright Self-Forgiveness Inventory (Kim et al., 2021). It is a 30-item survey that measured how one felt toward themselves, how they behaved toward themselves, and how someone thought about themselves, which overall measures levels of self-forgiveness. Participants were first asked to recall a time where they hurt someone and how that experience was for them, and then they answered the survey questions. A 6-point scale (from strongly disagree to strongly agree) was used to score 3 sets of 10 items addressing the positive and negative affect of how someone views, treats, and behaves towards themselves. An example of these statements would be, "I feel ____ towards myself" and then the participant would rank

different feelings such as “happy, positive, caring (etc.)” as strongly disagree or strongly agree (Kim et al., 2021). Half of the items were negative items to ensure that participants were paying attention and answering each question to the best of their ability. After reverse coding all negative items, the total scores can range from 5-30 with a higher score meaning higher self-forgiveness. In this sample, internal consistency reliability was high, with an alpha of .941.

Table 1.

Means, standard deviations, reliabilities, and correlations between procrastination, self-esteem, self-regulation, self-efficacy, and self-forgiveness.

Measure	1	2	3	4	5
1. Procrastination	1	-----	-----	-----	-----
2. Self-Efficacy	-.236**	1	-----	-----	-----
3. Self-Regulation	-.638**	.507**	1	-----	-----
4. Self-Esteem	-.389**	.565**	.602**	1	-----
5. Self-Forgiveness	-.322**	.441**	.533**	.710**	1
<i>M</i>	61.962	30.623	108.354	27.547	135.620
<i>SD</i>	14.416	4.572	4.572	17.25	22.782
<i>Alpha</i>	.897	.850	.916	.868	.941

Note. ** $p < .01$.

Results

Incomplete results were removed before analyzing the data. Common assumptions of normality and multiple regression were checked before analysis that appeared adequate for our planned analysis. For the final main statistical analyses’ bivariate correlations and multiple regressions were done. Procrastination was noted as the criterion or dependent variable, while

self-efficacy, self-regulation, self-esteem, and self-forgiveness were all noted as the independent variables.

Bivariate Correlations

We found significant correlations between all combinations of all of the variables. There were significant positive correlations between self-forgiveness and self-esteem ($r=.710, p <.01$), self-forgiveness and self-regulation ($r=.533, p <.01$), self-forgiveness and self-efficacy ($r=.441, p <.01$); self-esteem and self-regulation ($r=.602, p <.01$), self-esteem and self-efficacy ($r=.565, p <.01$), self-regulation and self-efficacy ($r=.507, p <.01$). These positive indications mean that when someone is showing high level of a variable such as self-forgiveness, their levels of self-forgiveness should also increase since the correlation coefficient is .710. There were significant negative correlations between all of the variables and procrastination, which is justifiable because these variables are all positive self traits that we would expect to help lower someone's susceptibility to procrastinate. Between procrastination and self-forgiveness ($r=-.322, p <.01$), procrastination and self-esteem ($r=-.389, p <.01$), procrastination and self-regulation ($r=-.638, p <.01$), and procrastination and self-efficacy ($r=-.236, p <.01$). Therefore, our hypothesis was supported, showing that there is a moderate negative correlation between self-related variables and procrastination, indicating that high/low levels of these self-variables are associated with low/high levels of procrastination.

Multiple Regression Analysis

A multiple regression analysis was run ($R^2=.424$) and found that 42% of the total variance in procrastination can be explained by the variables in the regression model. These are important and significant results because it shows that the variables used in the model are linked to procrastination. While overall, we found that the variables did account for a large amount of

effect in procrastination, after running a multiple regression analysis and looking at the uniqueness of each variable's contribution, it looks like only self-efficacy and self-regulation had significant results. A multiple regression shows that after accounting for the contribution of other predictor independent variables how much variance one specific variable directly explains procrastination. After accounting for all of the other variables it will tell us if the predictor being tested still has a significant predicted outcome with procrastination. Self-efficacy is considered significant at the .05 level, which means that self-efficacy does uniquely contribute to someone's procrastination levels ($\beta = -.153$). Self-regulation is significant at the .001 level, which meant that after taking into consideration all of the other variable's effect on procrastination, self-regulation held a significant unique influence when contributing to levels of procrastination ($\beta = -.678$).

Table 2.

Multiple Regression Analysis Predicting Procrastination

Predictor	R ²	β
	.424***	
Self-Efficacy		-.153*
Self-Esteem		-.81ns
Self-Regulation		-.678***
Self-Forgiveness		.018ns

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. ns= not statistically significant

Discussion

These findings of self-regulation and self-efficacy being the strongest predictors of procrastination are consistent with the results in Van Eerde and Klingsieck (2018), Hajloo

(2017), and Blouin and Pychyl's (2014) studies on self-regulation and self-efficacy. Van Eerde and Klingsieck (2018) found that self-regulation was correlated with procrastination. After implementing skills and solutions that specifically target self-regulation, they did find positive results that by breaking down self-regulation and the training of new self-regulatory skills helped students decrease their levels of procrastination. In Hajloo (2017), as well as Blouin and Pychyl's (2014) studies, they found that self-efficacy explained an extent of procrastination. By being able to regulate and increase self-efficacy, people felt more. Additionally, these research results further confirm Zacks and Hens (2018) idea that a person's internal state of being, mental and emotional state play a strong role in their tendency to procrastinate. Rather than looking at procrastination as being a result of external factors and due to a certain situation, someone lands in, these results can show that a person's procrastination tendencies come from within their own motivation and internal locus of control. It is important to keep researching these internal factors and learn how to target these internal emotions to help regulate procrastination levels.

The bivariate correlations showed promising results. All of these correlations were strong and significant at the .01 level. These correlations showed that when comparing each "self" variable with the other "self" variables they were positively linked together, which shows good internal reliability because it illustrates that the variables chosen were all related to consistently testing the same idea. By choosing these variables to test, we saw that they were positively related, so they were good at all being able to measure predictions of procrastination. All of the "self" variables had strong negative correlations with procrastination that were also significant at the .01 level. These results are consistent with the original hypothesis that these variables would have an effect on procrastination levels. It makes sense that these correlations would be negative since procrastination is a negative self-trait and all of these "self" variables are typically

considered positive trait variables. These bivariate correlations indicated that these variables are related to each other and that they do have a strong correlation with procrastination.

The multiple regression analysis revealed that about 42% of the variance in procrastination can be explained by these variables. However, when we look more closely at the numbers, we see that only self-regulation and self-efficacy provided significant results after each of the variables were taken into consideration to see what unique effect a variable would have. A reason for this could be that self-regulation and self-efficacy are more about self-control and how you view yourself, while self-esteem and self-forgiveness are more about how you feel. These results could show that procrastination is equally a combination of someone's mindset and also their ability to take action. Self-forgiveness and self-esteem might not have been different enough of variables to uniquely contribute to an effect on procrastination while self-regulation and self-efficacy are unique enough to explain levels of procrastination. This can also be seen in the bivariate correlation, with self-forgiveness and self-esteem having a strong correlation of .710 which was the highest correlation on the table.

My hypothesis and research questions about which "self" variable would essentially have the biggest impact on procrastination was supported with self-regulation being the most significant. What these results can mean for future researchers is that there should be an expansion of research looking specifically into self-regulation. Performing more studies based on one's ability to self-regulate could be helpful in learning new tactics and teachings for helping students procrastinate less. By targeting self-regulation skills such as time management, organization, motivation, goal setting, and self-monitoring, teachers, counselors and mentors can use this information to help more people decrease their levels of procrastination and decrease this undesirable trait. Self-efficacy also had a somewhat moderate impact on procrastination as one of

the “self” related variables. It did explain for some unique variance in procrastination, which means that exploring further and conducting further studies about self-efficacy’s correlation with procrastination could provide helpful information for future treatment plans.

Limitations

Despite the overall significant results reported, it is essential to acknowledge the limitations of this study. First, the participant demographics were not representative of a general population. The main focus of the study was not to look at specific populations, so factors like gender, race, or a specific age were not taken into consideration. The only specific requirements were that all of the participants had to be a student at Liberty University over the age of 18 in a psychology course to offer proper incentive. It was important to the study that it was college-aged students that were looked at, but the sample was not inclusive or representative of college students in America, just more specifically Liberty University students enrolled in a psychology course. In order to be able to offer proper incentive to take a voluntary survey, this was the population that was most accessible; however, this population is not necessarily representative of Liberty University students or of the greater population of people around the world. A recommendation for future research would be to open up this study to college students around the county or around the world by being able to offer other proper incentive to take a voluntary survey. Another recommendation would be to collect some identifying information if the study was opened up to a larger population such as region of the country, race, gender, age range.

A second limitation of the study was that I used self-report measures, and since ideas such as self-forgiveness, self-efficacy, self-esteem, and self-regulation are valued, sensitive concepts, it is unclear whether or not participants felt pressured to respond in a certain way. While the study was completely anonymous and there was no identifying information collected,

participants could still have felt pressured or afraid to respond a certain way. Additionally, with self-report measures people could be over or under exaggerative their experiences with themselves just depending on their personality. Internal qualities can be harder to measure than behavioral or physiological measures. Researchers should continue to think about other ways of measuring these constructs as objectively as possible.

A final limitation of the study is that since the design of the study was a correlational study, all of the causal claims would need to be made with some level of caution. While there were strong correlations, making claims based of correlations alone would not be able to hold much weight. To further see if these self-related variables indeed lead to differences in procrastination, future researchers should consider experimental studies. Manipulating some of the self-related variables could be challenging, but researchers could consider quasi experiment studies comparing groups of people with different levels of self-related variables to see which self-related variables had the largest effect on procrastination.

Conclusion

The problem of academic procrastination has been a prevailing and persistent issue faced by college students. Previous research has attributed one's tendency to procrastinate with their levels of self-efficacy, trait anxiety, and task aversiveness as well as other self-regulatory emotions (Constantin et al., 2018). The goal of many researchers and clinicians is to find a long-lasting solution that would modify student's behaviors and reduce levels of academic procrastination. Commonly researched techniques have been the use of acceptance and commitment therapy and cognitive behavioral therapy, and the newer form of intervention being technology based. While more research confirming positive effects from technology-based interventions needs to be performed, internet-based or smartphone-based treatment plans appear

to have the best results. Understanding the complexity of how emotions can impact behavior is important in learning how people function and how psychologists can help modify people's problem behavior. In the study I performed, I was able to determine that self-regulation and self-efficacy had the strongest inverse relationship with procrastination, which means future researchers and clinicians can apply these findings to further investigate individualized solutions to reduce procrastination.

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