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The effect of mindfulness and self-compassion on behavioral self-handicapping via an unstable self-concept

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**The effect of mindfulness and self-compassion on behavioral self-handicapping
via an unstable self-concept**

by

Lanmiao He

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology (Social psychology)

Program of Study Committee:
Douglas A. Gentile, Major Professor
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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

Ames, Iowa

2020

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ABSTRACT

Behavioral self-handicapping is a prevalent strategy among college students to protect positive views of themselves. Procrastination (Ferrari & Tice, 2000), alcohol consumption (Tucker et al., 1981), and inadequate practice (Tice & Baumeister, 1990) are considered to be academic self-handicapping behaviors because they all create some impediment to students' performance and facilitate a ready excuse for potential failures (Covington, 2000). Although a defense of one's self-concept can be provided by behavioral self-handicapping, self-handicapping behaviors come at a cost, such as non-optimal academic performance and self-deception (Zuckerman & Tsai, 2005). A lot of research has demonstrated the prevalence and negative effects of self-handicapping, but very few studies have examined methods that can reduce one's tendency to self-handicap (Kearns et al., 2007).

In the current set of studies, I proposed that an unstable self-concept gave rise to self-handicapping, and that such a self-concept was determined by self-worth contingency. I also proposed that mindfulness and self-compassion were potential intervention methods to reduce self-handicapping, because they might reduce self-concept instability.

In study 1, I examined whether academic performance feedback in a lab setting would influence students' academic concept. The result demonstrated that participants' explicit academic self-concept was altered by the feedback of their performance - a performance worse than average lowered participants' academic self-concept, and a performance better than average boosted participant's academic self-concept. I also examined if a short mindfulness meditation would help students to maintain a stable and competent academic self-concept after receiving positive or negative academic evaluations. The result demonstrated that mindfulness helped students to maintain a competent academic self-concept in an academic situation regardless of

the valence of the feedback. The mindfulness intervention didn't, however, affect the relation between valence of feedback and academic self-concept. The hypothesis that mindfulness would help students to maintain a stable self-concept was not supported.

In study 2, I examined if a short mindfulness meditation or a short self-compassion meditation helped students to lower their self-handicapping behavior in an evaluative situation. The self-compassion meditation helped students to choose more facilitating music during an academic test (i.e., an indicator of less self-handicapping) when they were faced with an evaluative situation, whereas mindfulness meditation had no effect. There was no difference in state self-handicapping tendency, or the time students spent on a distracting task during test preparation (i.e., another indicator of less self-handicapping).

In study 3, I examined if a short mindfulness meditation or a short self-compassion meditation helped students to lower their contingency of self-worth, which then might reduce self-handicapping behavior. The results demonstrated that the proposed mediation effect was not supported by the data. There was no evidence that self-worth contingency mediated the association between experimental manipulation and self-handicapping behaviors.

In conclusion, college students' academic self-concept was unstable enough to be altered by a single academic feedback. Mindfulness meditation was effective to help students keep a competent academic concept after receiving academic feedback. Self-compassion showed potential to lower one's self-handicapping behavior, but it was unclear if this effect was mediated by self-worth contingency or not.

CHAPTER 1. ACADEMIC SELF-HANDICAPPING BEHAVIORS AND THEIR PREVALENCE

Definition of Self-Handicapping

Behavioral self-handicapping in academic settings are behaviors that create potential impediments to one's academic performance. Such behaviors allow students to have a ready excuse for potential failure. Some examples of behavioral self-handicapping in academic settings are procrastination (Ferrari & Tice, 2000), alcohol consumption (Tucker et al., 1981), and inadequate practice (Tice & Baumeister, 1990). All these behaviors lower one's likelihood to succeed in academic settings and create an excuse for the potential failure.

Self-handicapping can be measured experimentally. For example, behavioral self-handicapping has been measured as a choice of listening to distracting music while performing a task (Rhodewalt & Savison, 1986), distracting oneself from practicing before performing a task (Ferrari & Tice, 2000), consuming performance-debilitating drugs before a task (Gibbons & Gaeddert, 1984), and so on.

Examples of Self-Handicapping Behaviors

Procrastination and alcohol consumption can be self-handicapping behaviors if they are used by students before academic performances and serve as an excuse for potential failures. These types of strategies are quite prevalent among college students. For example, a student may put off studying for an exam or drink the night before the exam, and when they fail or do worse than desired in the exam, they could say "It is because I didn't study, I am still a smart person" or "I failed because I still had a hangover during the exam, I can totally get a good score if I want to." In this way, they can protect their academic self-concept by externalizing reasons for failure. As a result, this student can maintain a positive view of his or her ability regardless of his or her

true academic performance. Thus, this student is deceiving him or herself into feeling more competent than is accurate.

Prevalence of Self-Handicapping Behaviors

An estimated 30% to 60% of undergraduates procrastinate starting academic tasks or put off finishing those tasks (e.g., preparing for exams; Rabin, Fogel & Nutter-Upham, 2011). They procrastinate for so long that getting an optimal academic performance becomes highly unlikely (Rabin et al., 2011). As for alcohol consumption, 79% American college students reported alcohol use in the past year and 38% reported having been drunk in the past 30 days, with both numbers exceeding their non-college peers (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2016). Researchers should note that not every student who engages in alcohol consumption or procrastination necessarily uses such behaviors as a self-handicapping strategy to externalize the reason for failure. Nevertheless, both self-reported procrastination and self-reported alcohol consumption positively correlate with self-reported academic self-handicapping (Beck, Koons, & Milgrim, 2000; Zuckerman & Tsai, 2005).

CHAPTER 2. NEGATIVE EFFECTS OF SELF-HANDICAPPING BEHAVIORS

As one might expect, academic self-handicapping behaviors predict poor academic outcomes. The more prevalent such behavior is, the worse effects are experienced by the college students. These negative effects have been grouped into three main aspects: debilitating effects of the specific self-handicapping behaviors themselves, self-deception, and non-optimal academic performance (Zuckerman & Tsai, 2005).

Negative Effect 1: Damages Related to Specific Handicapping Behaviors

There are debilitating effects of specific self-handicapping behaviors. As stated before, procrastination and alcohol consumption are forms of self-handicapping. Drinking leads to impairments in cognitive abilities (e.g., decision making and impulse control) and in motor skills (e.g., balance and hand-eye coordination) among college students (White & Hingson, 2013). The estimations for some of the alcohol-related harms among college students per year are: 599,000 injuries, 646,000 physical assaults, 97,000 sexual assaults, 2.7 million students' drunk driving, and 20 percent of college students' alcohol abuse and dependence (White & Hingson, 2013). For students who procrastinate habitually, they may experience internal subjective discomfort such as anxiety, irritation, regret, despair, or self-blame, they may also experience external consequences such as compromised performance, decreased learning, lost opportunities, and strained relations (Rabin et al., 2011).

Negative Effect 2: Self-Deception

Even though the specific negative effects of each self-handicapping behavior differ from each other, impeded academic performance and self-deception are common results of all self-handicapping behaviors. Self-deception is a surprising but likely side effect of self-concept protection after behavioral self-handicapping. In order to understand more about how self-

deception relates to self-handicapping, the readers need to understand how self-concept is constructed for students.

Definition of Self-Concept for Students

The term “self” has been used to refer to several distinct phenomena (Leary, 2007), which may give rise to confusion when reviewing the literature. In this dissertation, the term of “self-concept” will be defined as one’s representation of the self that can be consciously reflected upon (Markus & Wurf, 1987). Students’ self-concepts contain information from their internal arousal reactions (Bandura, 1977), direct attempts at self-assessment, social comparisons, and direct interactions (Markus & Wurf, 1987) in academic situations. For example, if a student believes that he performs better than most of his classmates (i.e., social comparison), feels relaxed (i.e., arousal reaction) in classes, and perceives himself to solve academic problems effectively (i.e., self-assessment), then this student has a competent academic self-concept.

The Construction of Self-Concept

Some aspects of one’s self-concept reflect on what the self actually is, while other representations reflect on what the self would like to be, could be, ought to be, or is afraid of being (Markus & Wurf, 1987). Self-concept is not only influenced by reality, it is also influenced by one’s existing ideas of what the self-concept should be like. This can be manifested in the example student who has a competent academic self-concept - he may also think he should perform well in every test, he could be in the first place on most exams, ought to become even more competent in academia, and he may therefore be afraid of showing incompetence in academia. The expectations of oneself can be conceived of as multiple layers in one’s academic self-concept.

Self-Concept Being Distorted

To the extent academic self-concept doesn't reflect reality, it reflects reality through the lens of one's expectations. If students want to have a competent self-concept, they can work hard to exhibit satisfying academic performances or just inflate their positive perception of their performances. In the case of self-handicapping, students' positive self-views in academia are inflated due to the externalized attribution of failure and internalized attribution of success.

There are costs related to the distorted self-concept nurtured by self-handicapping behavior. When a student wants to maintain an inflated self-representation, they need to avoid threatening information or they need to alter their interpretation of it. The degree of self-deception depends on one's need to protect one's self-concept. In general, when someone is obsessed with protecting their self-concept, they tend to use a conceptually driven mode of information processing that avoids and distorts information that doesn't fit the self-concept (Brown, Ryan, Creswell, & Niemiec, 2008). As a result, the information is processed in a biased way and the student is deceived by such biased information.

Negative Effect 3: Compromised Academic Performance

Besides self-deception, compromised academic performance is another common result of all self-handicapping behaviors. Self-handicapping behavior will lead to a paradox: on one hand, it involves an ultimate goal of maintaining (or enhancing) a desirable image; on the other hand, self-handicapping actually undermines the likelihood of mastery (Higgins, Snyder, & Berglas, 2013). A meta-analysis study that included 46 studies and 25,550 participants revealed that the mean correlations between self-handicapping and achievement was moderately negative ($r = -0.23$, $d=0.40$) (Schwinger, Wirthwein, Lemmer, & Steinmayr, 2014). This meta-analysis provided clear evidence that self-handicapping behaviors are related to compromised academic performance. In addition, empirical evidence has shown that procrastination is negatively

correlated with academic performance (Kim & Seo, 2015), binge drinking is also related to poor academic performance (Cox, Zhang, Johnson, & Bender, 2007). Thus, the specific kinds of self-handicapping behaviors also relate to compromised academic performance.

Ignoring Potential Helpful Information

When students use self-handicapping strategies to externalize the reasons for their failure, they lose the opportunity to understand how their performance reflects on their true abilities. In academia, information that threatens one's positive academic self-concept (i.e., self-threatening information) may be beneficial for students' academic performance and growth. For example, accurate feedback on poor performance may threaten students' self-concept, but it gives students the opportunity to reflect on their learning strategy and modify it accordingly. Even though self-threatening information can be quite valuable for an individual's growth in academia, the desire to protect one's self-concept leads students to avoid threatening information or alter their interpretation of it.

Inaccurate Self-Presentations

In addition, the inability to process self-threatening information in an open and accepting way may lead students to hold an inaccurate reflection of reality and a biased perception of their abilities. Both an inaccurate self-representation and the tendency to avoid real-life information may cost students the chance to improve their academic abilities and thus lowers their likelihood of future success.

CHAPTER 3. THE UTILITY OF SELF-HANDICAPPING BEHAVIORS

Self-Handicapping as A Defensive Strategy

Despite the negative effects of academic self-handicapping behaviors, their prevalence indicates that they are commonly used by college students. What is the reason for students to choose self-handicapping behaviors despite the damage to their academic performance and self-deception? To answer this question, the readers need to understand how self-handicapping behaviors defend a distorted self-concept. As stated previously, academic self-handicapping behaviors in real academic settings are behaviors that create impediments to one's academic performance. Such behaviors allow students to have a ready excuse for potential failure. Behavioral self-handicapping creates impediments in one's performance, which allows self-handicappers to discount responsibility for failure and to augment credit for success (Kelley, 1971; Zuckerman & Tsai, 2005). To be specific, when self-handicappers fail in a task, they can claim that it is the impediments, not the lack of ability, that led to the failure and that they would have performed well if such impediments did not exist. When self-handicappers succeed in a task, they can claim that their good performance demonstrates only part of their ability because they could have performed even better without the obstacles. In either scenario, the students' positive views of themselves in academia won't be challenged.

In this sense, self-handicapping can be seen as a defensive strategy; it protects the self by externalizing failure in situations with self-created impediments. Defensiveness has been defined as a strategy to protect the self against experiencing events that threaten people's positive views of themselves (Crocker, Niiya, & Mischkowski, 2008). To be specific, self-threatening information is avoided or distorted by individuals to be more consistent with their positive views of themselves (Barrett, Williams, & Fong, 2002; Crocker et al., 2008; Hodgins, Yacko &

Gottlieb, 2006). Defensiveness in academia can manifest in many ways, self-handicapping being only one.

Situational Factors for Self-Handicapping

Some situations may be more threatening, increasing the perception that the self needs to be defended more than that in other situations. Because the purpose of self-handicapping is to protect one's self-concept, self-handicapping only happens in situations that threaten important aspects of the self-concept (Higgins et al., 2013). For students who have a competent academic self-concept and value such a self-concept, self-handicapping can be predicted. For example, when a situation is indicative of one's real ability, an academic failure is likely to indicate a lack of competence and may threaten one's academic self-concept. Empirical evidence has shown that self-handicapping is likely to happen when people believe that task performance is indicative of their ability (Ferrari & Tice, 2000; Thomas & Gadbois, 2007) and when the outcome is likely to be a failure (Covington, 2000; Hobden & Pliner, 1995; Pulford, Johnson, & Awaida, 2005).

Individual Differences in Self-Handicapping

A Bias in Interpreting Experience as Threatening to Self-Concept

In addition to situational predictors, there are individual differences in the likelihood of self-handicapping. Generally speaking, students who tend to interpret experiences as threatening to self-concept and students who lack stability in self-concept are more likely to self-handicap. Students who have a bias in interpreting experiences as threatening to their self-concept are more likely to self-handicap. Research has shown that individual differences such as test anxiety (Higgins et al., 2013), lack of self-confidence (Karner-Hutuleac, 2014), and perfectionism (Frost, Marten, Lahart, & Rosenblate, 1990) predict the use of self-handicapping behaviors (Higgins et al., 2013).

A Lack of Stability in One's Self-Concept

A general tendency to feel good about oneself (i.e., high self-esteem) would appear to be laudable, and the stability of feeling good about oneself is also important (Kernis, Cornell, Sun, Berry & Harlow, 1993). Self-esteem stability can be defined as the magnitude of fluctuations in momentary, contextually based self-esteem (Kernis et al., 1993). Self-esteem instability is associated with negative emotions, social maladjustment, low life-satisfaction, and higher tendency to self-handicap (Crocker & Park, 2004, Hirt, Deppe & Gordon, 1991, Thomas & Gadbois, 2007). Thus, when two people have the same level of self-esteem, the one with a more stable self-esteem will typically have relatively better outcomes. Students' self-esteem can fluctuate across different academic contexts. Students who lack stability in one's self-concept are also more likely to self-handicap. For example, high self-esteem instability (Newman & Wadas, 1997) and low self-concept clarity (Thomas & Gadbois, 2007) predicts self-handicapping behaviors.

The Construction of Self-Concept and Self-Handicapping

Self-Concept Construction and Fragmental Information

Another factor that creates the need for academic self-handicapping behaviors lies in how students process their academic experience to generate representations of the self. Certain characteristics of this self-concept generating process make the self-concept vulnerable and needs defense. If people's self-concept changes greatly based on their immediate self-evaluations following performances, their self-concept tend to be unstable (Kernis et al., 1993). An unstable self-concept would need defense. If a student always has a stable self-view in any kind of situation, this student doesn't need to protect the academic self-concept. On the other hand, if one's academic self-concept fluctuates to a great extent in various situations, this student may need to defend self-concept when it is damaged.

Self-esteem is an evaluation of people's worthiness as individuals, a judgment that we are good, valuable people (Neff, 2011). It involves evaluating one's performance based on standards or other's approval in areas of perceived domain (Neff, 2003a). In colleges and universities, students may evaluate their performance in comparison to a set of academic standards to construct their state self-esteem.

Performance fluctuates across different tasks, so it is not always possible to meet one's personal goals and expectations (Neff, 2008). To be specific, if a student bases their momentary self-esteem on academic outcomes, perceived academic success or failure will not only influence their self-esteem but also the self-worth of the whole person (Crocker, Karpinski, Quinn, & Chase, 2003; Crocker, Sommers, & Luhtanen, 2002). The more a student judges his or her self-worth on performances in academia, the greater boost of self-worth one will experience after success and the greater drop in self-worth one will experience after failure (Neff, 2008). The investment of self-worth in academia leads to the instability of self-worth in one's self-concept. When performance results determine if one feels worthy or not, self-worth is more likely to be threatened by potential failure. As a result, students need to externalize the reason for failure to defend positive self-views in academia, which leads to self-handicapping behaviors.

Constructs that indicate unstable self-concept such as high self-esteem instability and low self-concept clarity predict self-handicapping behaviors (Newman & Wadas, 1997; Thomas & Gadbois, 2007). I propose that behavioral self-handicapping serves the purpose of defending an unstable self-concept. People defend their unstable self-concept via avoiding threatening information and distorting the implications of events (Hodgins et al., 2006). Students with an unstable self-concept use self-handicapping behaviors as a strategy to defend the self by both

avoiding threatening academic situations and by distorting the implication of academic performance.

Self-handicapping behaviors can be used to defend an unstable self-concept by making the performance less indicative of students' real ability. A poor performance can be attributed to impediments instead of to one's academic competence. The academic evaluation doesn't therefore convey threatening information to one's self-concept. Empirical evidence also supports the claim that people who employ self-handicapping behaviors tend to avoid threatening information. Research has shown that people who claim to engage in chronic procrastination tendencies (i.e., an example of self-handicapping) are more likely to engage in avoidance of self-relevant evaluations (Ferrari, O'Callaghan, & Newbegin, 2005), which is a form of avoiding potential threats. Alcohol consumption is another form of behavioral self-handicapping among college students. Students with a history of alcohol abuse or dependence have significantly higher levels of experiential avoidance relative to other students, which implies that experiential avoidance (i.e., any attempt to avoid internal experiences despite the negative consequences suffered by such experiential withdrawal, Blackledge & Hayes, 2001) may play a role in problematic alcohol use among college students (Levin et al., 2012).

Self-handicappers discount their responsibility for failure and augment their credit for success (Kelley, 1971). Regardless of one's academic performance, the implication of evaluative information is biased and will not convey threatening information; failure no longer implies a lack of competence. As a result, an unstable self-concept that depends on the implication of academic performance will not be threatened by failure experiences if one self-handicaps. Empirical evidence shows that self-handicapping is motivated by anticipated threats to self-

esteem (Feick & Rhodewalt, 1997; Smith & Snyder, 1982), indicating that self-handicapping serves as a strategy to distort the implication of threatening information.

Self-Concept Construction and A Filtered View

When the self only reflects parts of the reality that fit the existing contents of positive self-views, the parts of reality that don't meet the same standard will be filtered out of one's self-concept. As a result, one's constructed self-concept will be biased. Such a biased concept would need defense, because it is threatened by parts of reality that don't fit the existing contents of positive self-views. For college students, if they fixate on always maintaining a positive self-view, they distort self-knowledge to protect or enhance self-esteem (Baumeister, Heatherton, & Tice, 1993; Sedikides, 1993; Taylor & Brown, 1988). In this way, their self-concept stays biased and can be threatened by information that doesn't comply with this bloated self-concept. On the other hand, when a college student has a self-concept that reflects both success experiences and failure experiences, this student doesn't filter out information regarding self-knowledge. Such a student will have an unbiased self-concept and won't judge failure experience as threatening to the self-concept.

There is a good reason for students to be concerned with their academic self-concept: it has important consequences. Academic self-concept is a predictor of subsequent academic achievement (Choi, 2005; Guay, Marsh, & Boivin, 2003) and can influence students' success and retention in college. Although students like to think they are confident in academia, pursuing or protecting such a representation can be costly. There is a potential cost related to self-concept protection; some students may go too far to protect a competent self-concept by spending a lot of energy on defending it when such a self-concept is challenged by real-life events (Brown et al., 2008). Therefore, academic performance may be undermined if one is over-investing energy in defending self-concept.

According to self-worth theory of achievement motivation (Covington, 1984), the need for students to protect their sense of worth interacts with the idea that the possession of high ability indicates worthiness and then motivates students to maintain a sense of competence by avoiding failure in academia. For students whose academic competence is an important aspect of self-concept, negative academic performance is inconsistent with their self-concept and threatens the self. Those students' negative academic feedback will be processed at a shallower level than the positive academic feedback. In this way, the experience is filtered according to its threatening level to one's self-concept. Such filtration is also a type of experiential avoidance, which is defined as any attempt to avoid internal experiences (e.g., thoughts, feelings, and memories), despite the negative consequences suffered by such experiential withdrawal (Blackledge & Hayes, 2001; Saunders, Barawi, & McHugh, 2013).

Self-worth motivation can be defined as the need for students to protect their sense of worth (Covington, 1984). In this sense, people guard, protect, and defend their self as if it is a precious possession (Green & Sedikides, 2004). They do this by filtering information that doesn't fit their self-concept.

The perception and interpretation of one's experience can be influenced by the existing self-concept, which is in line with a two-stage self-relevant information processing model. This model proposes that all self-relevant information will be judged against the existing contents of self-concept to probe threats in the first stage, then only non-threatening information be processed further (i.e., compared to relevant and specific self-knowledge) in the second stage (Green & Sedikides, 2004; Saunders et al., 2013). Negative behavioral feedback concerning the important aspects of the self-concept generally conflicts with one's self-concept and threatens the self, thus, will be confined largely to the first stage (Green & Sedikides, 2004). As a result, the

processing of such negative self-relevant information will be relatively shallow. This will allow the self-concept to stay positive even though negative self-relevant information is present.

This research will focus on college students in North America. North Americans typically attempt to maintain a positive view of self in the face of negative self-relevant information (Heine, Kitayama, & Lehman, 2001). In this research, the product of such an attempt is defined as a biased self-concept. A biased self-concept can stay positive because negative self-relevant information is only shallowly processed. Such a biased self-concept may be threatened by failure experiences all the time, which leads to further filtration of experience. Thus, the need to protect one's self-worth by distorting experience is being reinforced by its own product.

When the self only reflects parts of the reality that fit the existing contents of positive self-views, the parts of reality that don't meet the same standard will be filtered out of one's self-concept. As a result, one's self-concept will be biased. To maintain such a biased self-concept, defensiveness is needed. As a type of defensiveness, behavioral self-handicapping maintains a biased self-concept.

For students with a competent but biased self-concept, an academic failure may contradict the identification of being capable in academia, being a leading student, or being a member in an established university. Such students may experience academic failures as threatening, and they need a strategy to filter out threatening information. Self-handicapping behaviors lead to a shallower processing of negative information by discounting the responsibility for failure. When students explain their failure to be caused by external factors such as a lack of effort, the negative information concerning one's ability is minimized and not processed as deeply. Due to the shallowly processed negative information input after behavioral self-handicapping, the biased self-concept is maintained.

CHAPTER 4. SELF-WORTH CONTINGENCY AND DISTORTED SELF-CONCEPT

Unstable Self-Concept and Self-Worth Contingency

Self-worth contingency contributes to the formation and maintenance of an unstable self-concept. Self-worth contingency indicates one's self-worth depends on their performance.

Fluctuating performance is associated with unstable self-concept. People's performance fluctuates across different tasks, so it is not always possible to meet the personal goals and expectations (Neff, 2008). If a student bases their momentary self-esteem on academic outcomes, perceived academic success or failure will not only influence their self-esteem but also the self-worth of the whole person (Crocker et al., 2002; Crocker, Karpinski, et al., 2003).

Definition of Self-Worth Contingency

The worth and value of the whole person (i.e., self-worth) can be threatened when he or she perceives a failure experience in a contingency of self-worth (Crocker, Karpinski, et al., 2003). A contingency of self-worth is defined as a domain on which people stake their general tendency to feel good or bad about themselves (i.e., self-esteem; Crocker et al., 2002; Crocker, Karpinski, et al., 2003; Crocker & Park, 2004). For people who are high on self-worth contingency, an experience of failure undermines one's perception of self-worth and a success experience gives a boost in one's perception of self-worth (Burwell & Shirk, 2006).

Fluctuation in Performance and Unstable Academic Self-Concept

Students who believe that ability is a critical part of success associate academic abilities with self-worth in a society that values accomplishment (Covington, 1984). Contingency of self-worth in academia or academic performance is, however, associated with unstable self-esteem (Crocker, Karpinski, et al., 2003). The stability of self-concept is related to the stability of self-esteem, which is determined by how much people weigh self-evaluative information; the more a

person's self-worth is contingent on evaluations, the more unstable this individual's self-esteem and self-concept will be (Kernis et al., 1993). For students, part of the self-evaluative information is the evaluation they have on themselves in academia. For example, a student may evaluate himself as incompetent in some academic settings but as competent in other academic settings. The more this student weighs such self-evaluative information, the less stable this student's self-esteem and self-concept will be.

In general, students' performance and self-evaluations change across various academic settings. If a student has an ongoing concern with self-worth and weighs specific pieces of self-evaluation substantially, this student is likely to have an unstable self-concept. On the contrary, if a student feels that one is a worthy person regardless of the situation and one's behaviors, one won't need to assess one's self-worth nor to pursue an increase in self-worth.

The Role of Self-Worth Contingency in Lowering Self-Concept Instability

If students stake their self-esteem on academic outcomes, perceived academic success or failure will influence their self-esteem and the self-worth of the whole person (Crocker et al., 2002; Crocker, Karpinski, et al., 2003). If this happens then students are more likely to demonstrate defensiveness, self-handicapping included. It is reasonable to say the key to help students maintain a stable self-concept and to reduce defensiveness is to detach their feelings of overall self-worth from the evaluative academic information (Kernis et al., 1993, Schwinger & Stiensmeier-Pelster, 2011). Several constructs and interventions that detach peoples' overall self-worth from specific evaluative information have been effective in reducing self-handicapping. These include mastery goal orientation and self-affirmation.

A mastery goal orientation is an orientation that motivates students towards learning and the development of competence. Such a goal orientation buffers the relation between self-handicapping and its determinants (e.g., low self-esteem). A mastery goal orientation indicates

that one's self and performance are not static. It also fosters the non-contingency of self-worth from specific performances (Schwinger & Stiensmeier-Pelster, 2011). To be specific, students with a mastery goal orientation are likely to experience self-esteem threats less frequently, because their attention is primarily on the mastery of the skill instead of on the performance in a particular situation or its implication for the self. A mastery goal orientation helps students to interpret a failure experience as a possibility for personal growth (Dweck & Leggett, 1988) instead of as a threat to their self-esteem (Schwinger & Stiensmeier-Pelster, 2011). The mastery goals leave students' self-worth intact regardless of their performance on a specific academic task (Schwinger & Stiensmeier-Pelster, 2011).

Self-affirmation theory indicates that one is concerned with maintaining overall self-integrity (Steele, 1988, McCrea & Hirt, 2011). Empirical evidence has shown that the self-affirmation in a domain unrelated to academia (e.g., aesthetics, social issues, and religion) reduces the self-handicapping behavior when students are faced with academically self-threatening stimuli (Siegel, Scillitoe, & Parks-Yancy, 2005). Self-affirmation detaches one's self-worth from performance in one specific area if they can affirm the self on an unrelated domain, which nurtures a non-contingency of self-worth in one specific area.

A cognitive behavioral therapy aimed at correcting cognitive inaccuracies among graduate students demonstrated the effectiveness of reducing behavioral self-handicapping (Kearns et al., 2007). In this intervention, the correction of inaccuracies such as "performance is the direct index of one's ability" aimed at detaching one's performance from one's perceived ability and perceived self-worth. It is reasonable to hypothesize that any psychological construct that detaches one's feeling of overall self-worth from evaluative academic information should mitigate behavioral self-handicapping.

Biased Self-Concept and Self-Worth Contingency

Self-Worth Contingency and Threatening-Biased Interpretation

Self-worth contingency is related to the process of maintaining a biased self-concept because it interacts with the need for students to protect their sense of self-worth. Contingency of self-worth in academia indicates that the students stake their self-worth on their academic achievements. In general, students' performance and self-evaluations change across various academic settings. For students with a high self-worth contingency, a bad feedback in academia may undermines one's perception of self-worth (Burwell & Shirk, 2006).

If students treat their self as a precious possession, they will guard, protect, and defend their self (Green & Sedikides, 2004). Students will use defensive strategies to protect the self against experiencing events that threaten people's positive views of themselves (Crocker et al., 2008). Self-threatening information is avoided or distorted by individuals to be more consistent with their positive views of themselves (Barrett et al., 2002; Crocker et al., 2008; Hodgins et al., 2006).

For students whose academic competence is an important aspect of self-concept, negative academic performance is inconsistent with their self-concept and therefore threatens the self. Negative academic feedback should therefore be processed at a shallower level than the positive academic feedback. In this way, the experience is filtered according to its threatening level to one's self-concept. Such filtration is also a type of experiential avoidance, which is defined as any attempt to avoid internal experiences (e.g., thoughts, feelings, and memories), despite the negative consequences suffered by such experiential withdrawal (Blackledge & Hayes, 2001; Saunders et al., 2013).

It is worth noting that self-worth contingency interacts with the need for students to protect their sense of worth in motivating students to maintain a sense of competence by

avoiding failure in academia (Covington, 1984). The need for students to protect their sense of worth should be stronger for students who have higher academic self-worth contingency. For students with higher self-worth contingency, a bad academic performance undermines one's perception of self-worth to a greater degree and is perceived as more threatening to the self. As a result, students with higher academic self-worth contingency have a higher need to protect their positive views when faced with failure.

The Role of Self-Worth Contingency in Lowering Threatening-Biased Interpretation

The need for students to protect their sense of worth should be lower for students who have lower academic self-worth contingency. For students with lower self-worth contingency, a bad academic performance doesn't undermine one's perception of self-worth too much. The negative academic feedback is perceived to be less threatening to the self and students have lower need to protect their positive views when faced with failure. Thus, it is reasonable to say detaching self-worth from specific performances mitigates threatening-biased interpretation their feelings of overall self-worth from the evaluative academic information.

The lower the tendency to interpret failure as threatening to the self-concept, the lower the need to defend one's self-concept. The lower the need to defend self-concept, the less likely an individual will conduct self-handicapping behaviors. Several constructs that lower the need to protect self-concept have demonstrated the effect of reducing self-handicapping behavior. A mastery goal orientation and self-affirmation not only detach peoples' overall self-worth from specific evaluative information but also lowers the need to protect self-concept.

Students with a mastery goal tend to interpret a failure experience as a possibility for personal growth (Dweck & Leggett, 1988) instead of as a threat to their self-esteem (Schwinger & Stiensmeier-Pelster, 2011). That is to say, a mastery goal lowers the tendency to interpret failure as threatening to the self-concept. It helps students to be open to and accept their failure

experiences as well as their success experiences in academia. According to the two-stage self-relevant information processing model, mastery goals allow the negative experience to be judged as non-threatening to the self in the first stage and enter the second stage of deeper processing.

Self-affirmation lowers the need to protect self-concept, because it serves the same purpose of self-handicapping, which is to neutralize self-threatening information (Siegel et al., 2005). After students affirms the non-academic aspect of the self, the overall self-worth is reinforced, then students can accept the threat without countering it (Siegel et al., 2005; Steele, Spencer, & Lynch, 1993). The affirmation of the self in a domain unrelated to academia (e.g., aesthetics, social issues, and religion) reduces self-handicapping behavior when students are faced with academically self-threatening stimuli (Siegel et al., 2005). It is reasonable to hypothesize that any psychological construct that lowers the need to defend self-concept should mitigate behavioral self-handicapping.

CHAPTER 5. PROPOSED ANTIDOTES TO SELF-HANDICAPPING BEHAVIORS

Focus of The Current Study

Understanding the reason for self-handicapping behaviors and the important influence of self-worth contingency in the process, I can further examine constructs that may lower self-handicapping tendencies. Although many studies have demonstrated the prevalence and negative effects of self-handicapping, very few studies have examined methods that reduce one's tendency to self-handicap (Kearns et al., 2007). Since a biased and unstable self-concept is related to behavioral self-handicapping, an intervention method that aims at reducing the extent of instability and bias could reduce behavioral self-handicapping.

Potential Antidote 1: Mindfulness

Definition of Mindfulness

Mindfulness can be used to lower self-handicapping behavior because it nurtures an open and non-judgmental way for people to relate to their experience and may reduce self-concept instability. One of the most cited definitions of mindfulness is “nonjudgmental attention to experiences in the present moment” (Kabat-Zinn, 1990). It refers to a “presence of mind” wherein attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place internally and externally (Shapiro, Brown, Thoresen & Plante, 2011). Mindfulness is also considered to be an inherent human capacity that can be enhanced through training and practice (Brown & Ryan, 2003; Shapiro et al., 2011).

Benefits of Mindfulness

Various studies have shown the effects of mindfulness on individuals' awareness, cognition, and emotion (e.g., Brown & Ryan, 2003; Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008; Hölzel et al., 2011; Thompson & Waltz, 2007). Some scholars use self-report

scales to measure trait mindfulness and its relation with different topics. The results show that a higher level of mindfulness predicts higher life satisfaction, energy, efficacy self-esteem, optimism, positive affects (Brown & Ryan, 2003), agreeableness (Thompson & Waltz, 2007), and empathy (Dekeyser et al., 2008). At the same time Mindfulness meditation has been reported to produce beneficial effects on a number of psychiatric, functional somatic, and stress-related symptoms (Hölzel et al., 2011).

Mindfulness and Its Effect on the Sense of Self

Little empirical research, however, has been conducted on the effect of mindfulness on practitioners' self (e.g., self-concept and self-representations, Hölzel et al., 2011). When an individual is unable to observe one's experience non-judgmentally, this individual will identify with contents of consciousness and construct a static sense of self (Hölzel et al., 2011). For example, when a student has some bad academic performance, he or she may think one is incompetent and feel frustrated. If this student has a low level of trait mindfulness, this individual will identify with the inner experience and think "I am such a bad student". To the contrary, if students can observe their inner experience while undergoing academic evaluations, they will be able to recognize that their thoughts and feelings constantly change, the harsh self-judgment and negative emotions will fade away. They can develop the insight that they are not what they think or what they feel and not use these fragmental experiences to define the self.

If students have a low mindfulness level, they will theoretically have a harder time observing their inner experience non-judgmentally while undergoing academic evaluations. In theory, students with a low mindfulness level will elaborate their thoughts and feelings automatically, and may rely substantially on such inner experience to form their immediate and static self-concept. In contrast, if students have a high mindfulness level, they should observe their inner experience while undergoing academic evaluations. They should be more able to

recognize that their thoughts and feelings change all the time. They should develop the insight that they are not simply what they think or what they feel. As a result, they should not rely as heavily on fragmental experiences to define the self.

The Rationale for Mindfulness Reducing Self-Handicapping

In general, students' performance and self-evaluations change across various academic settings. If a student has an ongoing concern with self-worth and weighs specific pieces of self-evaluation substantially, this student is likely to have an unstable self-concept. In contrast, if a student feels that one is a worthy person regardless of the situation and one's behaviors, that student won't need to assess one's self-worth nor to pursue an increase in self-worth in reaction to a given negative event. Mindfulness has the potential for lowering self-concept instability due to its nurturing effect on decentering and non-elaborative process. These will be described below in detail.

Decentering is defined as a process during which mindful, nonjudgmental observation fosters a detachment from identification with the contents of consciousness (Hölzel et al., 2011). A similar concept is nonattachment, defined as a flexible, balanced way of relating to one's experiences without clinging to or suppressing them (Sahdra, Shaver, & Brown, 2010). Decentering prevents or reduces individuals' identifying with their contents of consciousness; with a higher level of decentering, students are less likely to cling to success experience or to suppress failure experience. They have a lower tendency to identify with inner experience (e.g., thoughts and feelings) in self-worth contingent situations. That is to say, they will not use their inner experience as an index of their self-worth. In this way, the sense of self can be experienced as an ongoing event rather than as a static entity (Hölzel et al., 2011). It is reasonable to hypothesize that nonattachment will reduce self-worth contingency.

Non-elaborative awareness is characterized by observing, acknowledging and releasing thoughts, sensations and emotions without further, secondary cognitive elaboration (Burschka, Keune, Hofstadt-van Oy, Oschmann, & Kuhn, 2014). Mindfulness is often described as a state of non-elaborative awareness of current external and internal experiences (Watier & Dubois, 2016). Mindfulness nurtures a tendency to experience the current moment as it is, without the need to add a story or commentary to it. Practitioners with such a tendency won't organize their experiences with secondary cognitive elaboration; they are less likely to process experience in a biased way and can experience the current events in an open and accepting manner (Burschka et al., 2014).

A student with a high level of non-elaborative awareness should have a low tendency to elaborate on the experience related to bad academic feedback. Such a student will not weigh this negative self-evaluative information too much in determining the worthiness of the self. The less this student weighs such self-evaluative information, the lower self-worth contingency will be.

As discussed previously, self-worth contingency plays an important role in constructing a self-concept that is vulnerable and needs defense. It is possible that mindfulness lowers the need to protect their academic self-concept via lowering self-worth contingency.

Although there is not a lot of empirical support for the claim that mindfulness mitigates self-handicapping (i.e., a form of defensiveness), several studies indicated that mindfulness reduces other forms of defensiveness. Higher mindfulness predicted a lower level of verbal defensiveness in participants' response to self-threatening questions (e.g., Tell me about a time when you've done something unethical on an assignment; Describe a time when you have felt less sexually desirable than a friend.) five weeks later (Lakey, Kernis, Heppner, & Lance, 2008). In addition, mindfulness appears to directly reduce ego-protective motives that affect how people

process information about themselves (Carlson, 2013). I propose that mindfulness will lower the self-worth motivation as well as the tendency to use self-handicapping as a form of defensiveness

Potential Antidote 2: Self-Compassion

Definition of Self-Compassion

Self-compassion also has the potential to lower self-handicapping behavior because it nurtures a non-critical and balanced way for people to relate to their experience and may reduce academic self-worth contingency. Self-compassion is defined as maintaining a caring and compassionate attitude towards oneself when faced with difficult situations or perceived inadequacy (Neff, Kirkpatrick, & Rude, 2007). To be specific, self-compassionate people are open to and touched by their own suffering without avoiding or disconnecting from the experience; they have the desire to alleviate their own suffering with kindness; they also recognize the experience of failure and feeling inadequate is a common human experience (Neff, 2003a).

Benefits of Self-Compassion

Self-compassionate people are more likely to have better psychological health than people who are low in self-compassion. After experiencing pain or sense of failure, self-compassionate people don't amplify or perpetuate these feeling through condemning themselves harshly, feeling isolated, and over-identifying with their inner experience (Neff, 2003a). In contrast, people with high self-compassion would want to alleviate the suffering or may even prevent it to happen in the first place. That is to say, they take actions (e.g., keeping a healthy diet and get rest when they need it) to improve their well-being and alleviate suffering (Neff, 2003a).

Self-Compassion and Its Effect on Constructed Self

Besides a positive association with psychological health and self-caring behaviors, self-compassion should also relate to a stable and less inflated self-concept. Self-compassionate people adopt an unconditionally caring emotional stance toward oneself (Neff, 2003a), so they have a stable source of positive self-regard while being less ego reactive and inflated (Neff & Vonk, 2009).

People with an unstable self-concept tend to have an ongoing concern with self-worth and weigh specific pieces of self-evaluation substantially. Self-compassionate people, however, do not base their self-worth on performance evaluations against ideal standards (Neff, 2003a). Self-compassion reduces the need for an ongoing self-evaluation process by assuming self-worth is an intrinsic aspect of existence (Neff, 2003a). As a result, self-compassion is associated with less fluctuation in feelings of self-worth overtime (Neff & Vonk, 2009). In this sense, self-compassion stabilizes one's self-concept, because the intrinsic self-worth doesn't depend on self-evaluation information any longer. Empirically, self-compassion predicted more stable feelings of self-worth than self-esteem and was less contingent on particular outcomes.

When people judge themselves harshly for their failings, their positive self-views need to be defended by screening the inadequacies from self-awareness (Neff, 2003a). On the contrary, self-compassion nurtures a non-evaluative way for one to relate to their experience. For self-compassionate people, they have less need to protect the self against experiencing events that threaten people's positive views of themselves because they do not need to avoid the harsh self-judgment anymore. In this sense, self-compassion lowers one's tendency to defend the self against experiencing events that threaten people's positive views of themselves (Crocker et al., 2008). Thus, defensive strategies such as self-handicapping are less needed. Empirically, self-compassionate people have less fear of failure, and they are more likely to try again when they

do fail (Neely, Schallert, Mohammed, Roberts, & Chen, 2009). This indicates that self-judgment is less harsh for self-compassionate people.

The Rationale for Self-Compassion Reducing Self-Handicapping

Self-compassion doesn't try to label, judge, or evaluate the worth of who we are (Neff, 2011), and self-compassion depends less on social approval and particular external outcomes (Neff & Vonk, 2009). Self-compassionate people have a stable sense of positive regard that doesn't require them to judge or evaluate themselves (Neff, 2011). Extending the work on self-compassion to the current topic, if students have a high level of self-compassion, they should base their self-worth on individual performance evaluations less (Neff, 2003a), and have lower levels of self-worth contingency. To be specific, self-compassionate students would not doubt their self-worth after getting negative academic feedback, because they don't weight specific pieces of self-evaluation substantially in judging one's self-worth. As a result, the link between academic self-concept and academic performances is weakened. Students with high self-compassion also have less need to protect the self-concept against experiencing negative academic evaluations. This is because they do not generate harsh self-judgments. Also, self-compassion should lower self-worth contingency, and a given failing experience is less threatening to the sense of worthiness.

To sum up, self-compassionate students would not need to protect their positive self-views after getting a negative feedback in academia, because they do not judge themselves harshly and they don't interpret it to be a lack of self-worth. Two studies demonstrated the negative correlation between self-compassion and self-handicapping in self-report (Akin & Akin, 2015; Petersen, 2014). I propose that self-compassion will lower the self-worth contingency as well as the tendency to use self-handicapping as a form of defensiveness.

CHAPTER 6. OVERVIEW OF THE PRESENT STUDIES

The current set of studies proposed that an unstable and biased self-concept gave rise to self-handicapping, and that such a self-concept was influenced by self-worth contingency. I also proposed that mindfulness and self-compassion were both potential intervention methods to reduce self-handicapping, because they should reduce self-worth contingency. In addition, I proposed that mindfulness would help students to maintain a stable and competent academic self-concept after they got academic evaluations.

In study 1, I examined if a short mindfulness meditation would help students to maintain a stable and competent academic self-concept after they received academic evaluations, hypothesizing that it would. The hypothesized relations among mindfulness, academic feedback, and academic self-concept are shown in Figure 1.

In study 2, I examined if a short mindfulness meditation or a short self-compassion meditation helped students to lower their self-handicapping behavior. I hypothesized that both a short mindfulness meditation or a short self-compassion meditation should help students to lower their self-handicapping behavior in an evaluative situation. These hypothesized relations are shown in Figure 2.

In study 3, I examined if a short mindfulness meditation or a short self-compassion meditation helped students to lower their contingency of self-worth, which then reduced self-handicapping behavior. I hypothesized that both a short mindfulness meditation and a self-compassion meditation would help students to lower their contingency of self-worth, which then would reduce self-handicapping behavior. These hypothesized relations are shown in Figure 2.

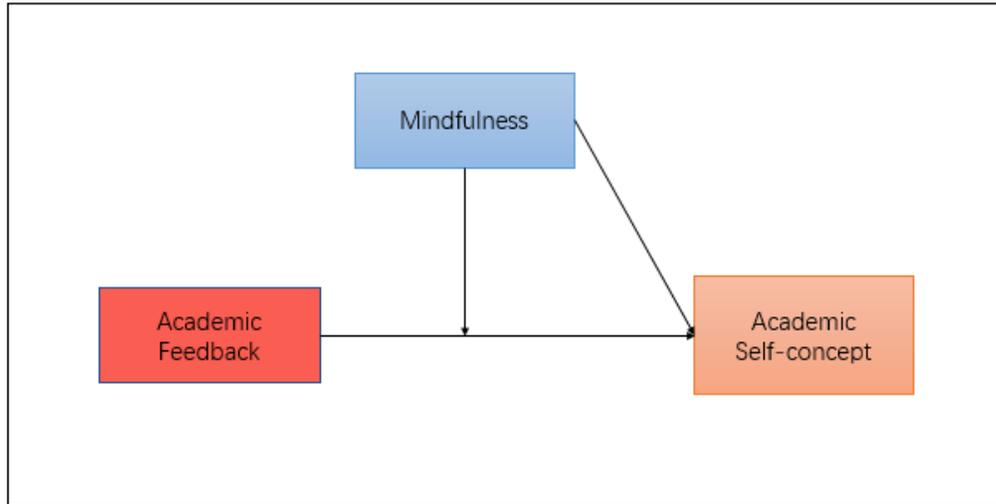


Figure 1. Illustration of hypothesized relations among mindfulness, academic feedback, and academic self-concept.

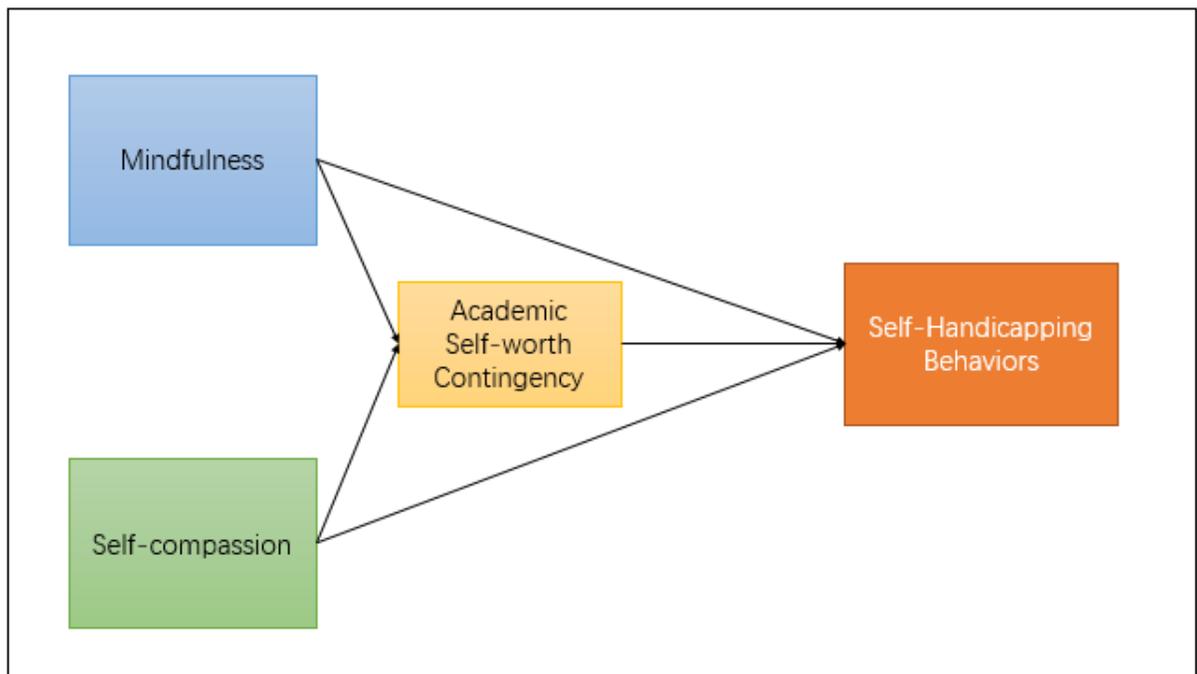


Figure 2. Illustration of hypothesized relations among mindfulness, self-compassion, academic self-worth contingency, and self-handicapping behaviors.

CHAPTER 7. STUDY 1

Based on the discussion that students may judge their ability on fragments of their experience and this process leads to an unstable self-concept, I expected that students' state self-concepts were contingent on academic feedbacks they got. Students' academic achievement influences self-concept in the long term (Guay et al., 2003), but scholars haven't examined the causal effect of academic performance on students' immediate academic self-concept. In Study 1, I experimentally examined if feedback from an academic evaluation changed students' self-concept.

I proposed that mindfulness would buffer students to experience the instability of self-concept, because it helped the students to deidentify with their inner experience while undergoing academic evaluations. Even though a drastic sense of disidentification from the static self is not expected to be experienced until after advanced meditation practice, the detachment of people's identity from the contents of consciousness is experienced in the earliest stages of meditation practice (Hölzel et al., 2011). I therefore expected the effect of academic feedback on students' self-concept would be weaker for students who participated in a short mindfulness mediation. Mindfulness should also help students to maintain a competent self-concept, since it should also enhance self-acceptance and self-kindness (Ivtzan, Gardner, & Smailova, 2011), which nurtures a stable sense of positive regard without self-judgment or self-evaluation (Neff, 2011).

There were two goals of study 1. The first goal was to test experimentally whether academic performance feedback in a lab setting would influence students' academic concept. I hypothesized that receiving a positive performance feedback on the academic task would enhance student's academic self-concept, and a negative performance feedback would lower

students' academic self-concept. The second goal was to test experimentally whether a short mindfulness meditation would help students to maintain a competent and stable academic self-concept after they received academic evaluations, perhaps especially after a negative evaluation. I hypothesized that a short-term mindfulness meditation would help students to report a competent academic self-concept after the evaluation, demonstrated by the higher academic self-concept for the mindfulness group. I also hypothesized that the effect of the valence of academic feedback on students' self-concept would be weakened for students in the mindfulness mediation group compared to other groups. I expected such effect to be demonstrated by the interaction between audio experimental manipulation and feedback manipulation.

Method

Participants

Seven hundred and thirty-nine undergraduates from a Midwestern university in the United States participated in this study to get course credit in introductory psychology classes. The mean age was 19.3 ($SD = 2.1$). Among the participants, 271 were male, 452 were female, and 16 participants didn't report gender. The distribution of males and females in each of the six conditions ranged from 30% to 46%. Among the students, 84.7% were white, 3.7% were African American, 3.7% were Asian/Pacific Islander, 3.1% were Latino/Hispanic, 0.1% were Native American, 3.6% were Multi-Racial, 0.7% reported other races, also 0.3% didn't report race.

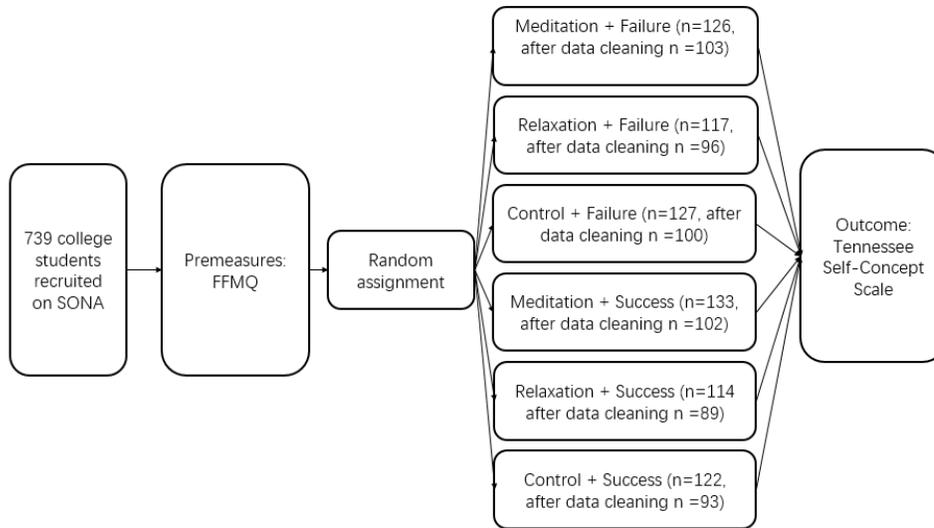


Figure 3. Graphic illustration of Study 1.

Procedure

This was a 2 (i.e., Success feedback vs. Failure feedback) \times 3 (i.e., meditation, relaxation, vs. no audio) factor between-subject design. The Graphic illustration of Study 1 is shown in Figure 3. All participants completed the Five Facet Mindfulness Scale (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) before the audio intervention. Participants were randomly assigned to listen to an audio to meditate, an audio to relax, or no audio. After the audio intervention, all participants were instructed to finish a word association task and received feedback on their performance. Half of the participants were led to think they did better than their peers, the other half of the participants were led to think they did worse than their peers. As a dependent measure, participants completed the Tennessee Self-Concept Scale (Fitts & Warren, 1996).

Pre-experimental Measures

The Five Facet Mindfulness Scale (Appendix B1). The Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006) includes five component skills: observing, describing, acting with awareness, nonjudging of inner experience and nonreactivity to inner experience. It

contains 39 items. Findings supported the construct validity of the FFMQ in a combination of meditating and nonmeditating samples (Baer et al., 2006). In the current study, the coefficient alphas were 0.742 for observing, 0.873 for describing, 0.867 for acting with awareness, 0.875 for nonjudging of inner experience and 0.735 for nonreactivity to inner experience.

Experimental Conditions

The six conditions in this study differed by audio intervention and academic-evaluation situation. The three forms of the audio intervention were meditation, relaxation, or none. The two forms of the academic evaluation situation were an easy and difficult version of the word association task. The group that got an easy version of the task were led to think they performed better than their peers and the other group were led to think they performed poorly. More information about the evaluation condition can be found in the later section describing remote associates test (RAT). In sum, the six conditions are shown in Figure 3.

The Meditation Intervention (Appendix A1). The mindfulness task involved listening to a 12-min recorded instruction (UCLA Health, n.d.) that touched briefly on breath meditation, sound mediation, and loving kindness meditation. A part of the instruction is shown below.

“...Then you can focus on your breathing. Feeling your breath, in the area of either the abdomen, chest, or nostrils. Feeling the gentle rising and falling of your abdomen or chest, or the coolness and in and out sensations at your nostrils. So the breath is our anchor. It’s where we establish our awareness. It helps us have something to always return to this simple act of breathing...”

This mindfulness meditation was representative of typical mindfulness of breath meditations. It fostered a non-judgmental observation towards one’s experiences such breathing, listening, and body sensations.

The Relaxation Intervention (Appendix A2). The relaxation intervention involved listening to an 11-min recorded progressive muscle relaxation (Aggiementalhealth, 2013). A part of the instructions is shown below.

“...We are going to start with our arms and hands. So tensing up folding your arms, hands. Tensing up your biceps, your triceps, and your hands. Feeling that tension in your arms and hands. Tense. Tense. Tense. And then relax. Breathe in and out. And let the muscles in your arms and in your hands relax. Teach your muscles the difference between tension and relaxation...”

This relaxation intervention matched the mindfulness meditation in some respects, because it also requested participants to pay attention to their sensation. It differed from mindfulness, because relaxation intervention focused more on the regulation of one’s physical state instead of on the observation of one’s inner experience.

The Control Intervention. The control group did not get any intervention. They moved on to the next part of the study after the pre-measures.

Remote Associates Test (RAT; Appendix A3). The remote associates test I used is very similar to that of Crocker and Park (2004). The RAT (McFarlin & Blascovich, 1984) measured verbal ability; participants were given three cue words and asked to think of a fourth word that associated with the three given words (e.g., cottage-swiss-cake and cheese). In this study, participants were given accurate feedback of their performance on 12 RAT questions and false normative statistics that stated: “The average student at our university scores 6 of 12 questions correctly, and the average college student nationwide scores 5.3 of 12 questions correctly.” On average, participants who received the difficult version of the task answered 2.66 ($SD = 2.40$) questions correctly, and participants who received the easy version of the task answered 7.95 (SD

= 3.17) questions correctly. Thus, the former group were led to believe that they didn't perform as well as their peers and failed. On the other hand, the latter group were led to believe that they performed better than their peers and succeeded.

Post-experimental Measures

Tennessee Self-Concept Scale. The Tennessee Self-Concept Scale (Fitts & Warren, 1996) has eighty-two items and allows participants to describe them in a 5-point Likert scale in the follow domains: physical self-concept, moral self-concept, personal self-concept, family self-concept, social self-concept, academic self-concept, self-identity, self-satisfaction, and self-behavior. I used items on academic self-concept (e.g., Math is hard for me; I am not as smart as the people around me). The coefficient alpha was 0.737 in this study.

Demographic Questionnaire (Appendix B9). The demographic questionnaire contained questions about participants' age, gender and previous meditation experience, such as if participants had meditation experience, the frequency of meditation practice, and the average length of the meditation practice.

Data Analyses

The analyses, such as descriptive statistics and analysis of covariance (i.e., ANCOVA), were conducted in SPSS 20.0.

Results

Preliminary Analyses

Thirty-eight participants failed more than one out of three attention checks in the study and were therefore excluded from the analysis. In addition, participants' score in the RAT (i.e., the number of correct answers) was compared to the false normative statistics (i.e., "The average student at our university scores 6 of 12 questions correctly, and the average college student nationwide scores 5.3 of 12 questions correctly") as a manipulation check. If a participant was

assigned to the RAT success condition but scored less than average in this task, the experimental manipulation of feedback type (i.e., success) wouldn't work on this participant. Similarly, if a participant was assigned to the RAT failure condition but scored more than average in this task, the experimental manipulation of feedback type (i.e., failure) wouldn't work on this participant. So, participants in the success condition who got a score of 5.3 or lower were excluded from the analysis; participants in the failure condition who got a score of 6 or higher were excluded from the analysis.

In total, 118 students failed the manipulation check for the RAT conditions. Among them, 50 participants were assigned in the RAT failure condition but got a score of 6 or higher; the other 68 participants were assigned in the RAT success condition but got a score of 5.3 or lower. These 118 students who failed the manipulation check were excluded from the analysis.

Further analysis was done to examine the exclusion pattern across different conditions. A logistic regression was conducted to examine the odds of the exclusion of a participant in relation to feedback type and audio type. The logistic regression model with feedback type and audio type as independent variables and their interaction term did not predict the logit odds of participants failing the manipulation check ($\chi^2(5) = 4.659, p = 0.459$). So, the exclusion pattern did not differ by conditions. This indicated that participants' failing manipulation check did not differ across conditions, so the exclusion of such participants was justified.

Comparisons were done to check whether participants who failed the manipulation check differed from those who didn't. The exclusion group and the inclusion group did not differ in terms of age ($t(696) = 1.046, p > .05$), trait mindfulness ($t(698) = 0.982, p > .05$), academic self-concept ($t(699) = -0.923, p > .05$), ethnicity ($\chi^2(6, N=699) = 7.197, p > 0.05$), previous meditation experience ($\chi^2(1, N=701) = 1.589, p > 0.05$), meditation practice frequency ($\chi^2(3, N=185) = 2.685,$

$p>0.05$), or average meditation practice length ($\chi^2(3, N=184)=4.810, p>0.05$). However, the exclusion group and the inclusion group differed in terms of gender ($\chi^2(1, N=698) = 4.329, p=0.037$). Females were more likely to fail the manipulation check. Because this indicated that the exclusion group and inclusion group may differ in group make-up, the main ANCOVA analysis on academic self-concept score as the dependent variable was run twice, once excluding participants who failed the manipulation check, once including every participant. The results were compared to examine the effect of excluding cases on analysis results.

Additionally, a participant's response on a certain scale was excluded if one failed to respond to 3 or more items in the scale. If a participant missed only 1 or 2 items on a scale, the missing data were imputed by using the mean of one's response to other items in the same scale. Hence, analyses described below included the data of the remaining 583 participants.

The six groups did not differ in terms of age ($F(5, 575) = 0.328, p > .05$), gender ($\chi^2(5, N=582)=6.257, p>0.05$), ethnicity ($\chi^2(30, N=582)=33.761, p>0.05$), previous meditation experience ($\chi^2(5, N=583)=4.358, p>0.05$), meditation practice frequency ($\chi^2(15, N=148)=18.238, p>0.05$), and average meditation practice length ($\chi^2(15, N=147)=14.708, p>0.05$).

Main Analyses

After exclusion of the 118 participants who failed the manipulation check, the mean academic self-concept scores for six conditions ranged from 3.51 to 3.72 (Table 1 and Figure 4).

Table 1. Mean and standard deviation scores of academic self-concept for six conditions

Condition	Mean	SD	N
Meditation + Failure	3.59	0.40	103
Relaxation + Failure	3.63	0.46	96
Control + Failure	3.51	0.48	100
Meditation + Success	3.72	0.41	102
Relaxation + Success	3.67	0.43	89
Control + Success	3.63	0.48	93

Note. SD = Standard Deviation. N = number of participants.

A two-way (2×3) ANCOVA was conducted with academic self-concept score as the dependent variable, feedback type (i.e., success vs. Failure) and audio type (i.e., meditation, relaxation, vs. no audio) as the 2×3 factors, and trait mindfulness as a covariate. There was a main effect for feedback type ($F(1)=7.648, \eta^2=0.013, p=0.006$), and audio type ($F(2)=3.966, \eta^2=0.014, p=0.019$). There was no interaction between audio type and feedback type ($p=0.545$), but audio type and trait mindfulness did interact ($F(2)=3.489, \eta^2=0.012, p=0.031$). Trait mindfulness ($F(1)=172.195, \eta^2=0.231, p<0.001$) was significant as a covariate in ANCOVA result.

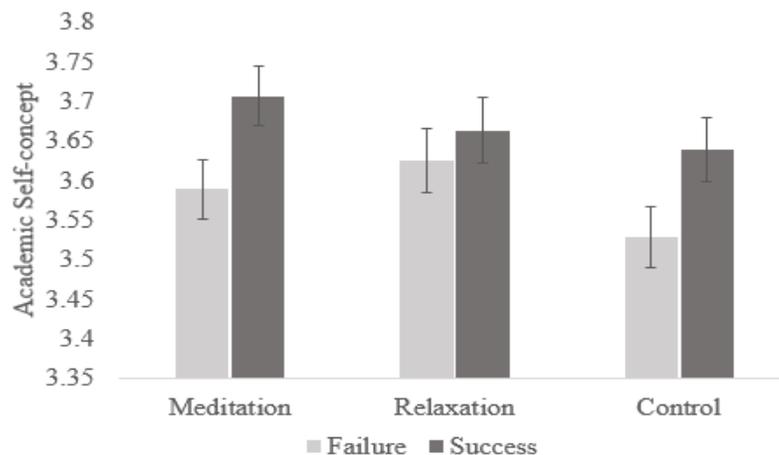


Figure 4. Mean scores of academic self-concept in six conditions in Study 1.

Note. Covariates appearing in the model are evaluated at the following values: FFMQ = 3.2098. Error bars denote one standard error around the mean.

A post-hoc test revealed that, compared to the failure condition in RAT, participants in the success RAT condition reported higher academic self-concepts ($B=-0.11, p=0.049, d=0.226$). Also, compared to the no-audio group, the meditation audio group showed a higher academic self-concept ($B=0.945, p=0.005, d=0.197$), but the relaxation group did not show such a difference from the control group ($B=0.450, p=0.197, d=0.177$). In addition, the effect of

meditation audio was stronger for participants who had a lower level of trait mindfulness ($B=-0.273, p=0.009$). This relation is displayed in Figure 5.

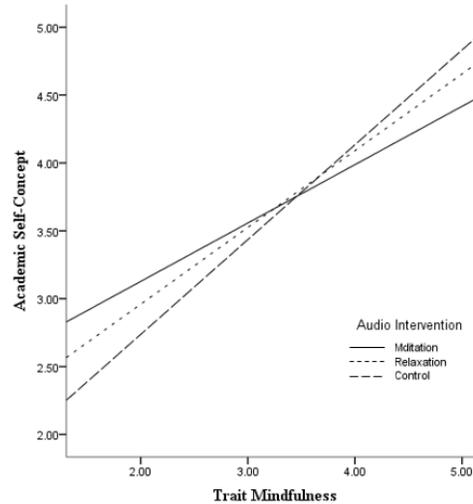


Figure 5. Interaction between trait mindfulness and audio type on academic self-concept

To examine the effect of case exclusion on analysis result, the same two-way (2×3) ANCOVA was conducted without excluding participants who failed the manipulation check. The analysis results basically stayed the same but for one difference. The difference was that the main effect for feedback type was not significant using the total sample ($F(1)=1.934, \eta^2=0.003, p=0.165$). The rest of the analysis results did not differ. There was a main effect for audio type ($F(2)=3.756, \eta^2=0.011, p=0.024$). There was no interaction between audio type and feedback type ($p=0.989$), but audio type and trait mindfulness did interact ($F(2)=3.138, \eta^2=0.009, p=0.044$). Trait mindfulness ($F(1)=172.195, \eta^2=0.231, p<0.001$) was significant as a covariate in ANCOVA result. A post-hoc test revealed that, participants in the failure condition in RAT and participants in the success RAT condition did not differ in the level of academic self-concept ($B=-0.043, p=0.395, d=0.113$). This was not surprising, due to the inclusion of participants who failed the manipulation check. Compared to the no-audio group, the meditation audio group

showed a higher academic self-concept ($B=0.838$, $p=0.007$, $d=0.180$), but the relaxation group did not show such a difference from the control group ($B=0.468$, $p=0.150$, $d=0.153$). In addition, the effect of meditation audio was stronger for participants who had a lower level of trait mindfulness ($B=-0.236$, $p=0.012$).

Discussion

After exclusion of the 118 participants who failed the manipulation check, participants' explicit academic self-concept was altered by their performance on a word association test - a performance worse than average lowered participants' academic self-concept, and a performance better than average boosted participant's academic self-concept. This implies that students' explicit academic self-concept depended on the feedback of academic tasks. Thus, the feedback of an academic task, even a trivial one, could lead to changes in college students' academic self-concept. This also meant college students on the whole could not detach their feelings of being competent or incompetent in academia from specific performance results. This finding was very important to understand the prevalence of self-worth protection.

This finding was influenced by the inclusion of students who failed the manipulation check on the RAT test. Such a phenomenon is not surprising. If a participant was assigned to the RAT success condition but scored less than average in this task, the experimental manipulation of feedback type (i.e., success) wouldn't work on this participant. Similarly, if a participant was assigned to the RAT failure condition but scored more than average in this task, the experimental manipulation of feedback type (i.e., failure) wouldn't work on this participant. The manipulation of feedback type (i.e., the difficulty level of RAT items) was not strong enough to make sure every participant got the random feedback type that they were assigned to. Future studies should use stronger manipulations such as assigning impossible items to participants in the failure condition or providing false feedback. Other activity types such as solving anagrams or tangrams

could also be used in future studies to facilitate the manipulation of feedback type (i.e., success vs. failure).

The contingency and instability of self-concept may cause individuals to self-handicap (Hirt et al., 1991; Thomas & Gadbois, 2007) and thus, hinder academic performance (Schwinger et al., 2014). A stable and non-contingent self-concept may be the key to accelerate growth and improve performance in academia. The findings indicated that educators and students might need to find a solution to reduce the instability of self-concept and to nurture a stable academic self-concept among college students. Students may want to find a method that can detach their judgment of overall academic ability from the fragmentary evaluative academic information (Kernis et al., 1993). A short-term mindfulness meditation helped students to maintain a more competent academic self-concept after they received evaluative feedback. Thus, my hypothesis that short-term mindfulness meditation would nurture a competent self-concept in an evaluative situation was supported by the data.

Trait mindfulness also helps students to maintain a more competent academic self-concept after they receive evaluations. Trait mindfulness explained the biggest part of the reported academic self-concept, as it had the highest effect size (i.e., partial eta squared η^2) in the ANCOVA. Trait mindfulness can be seen as an inherent capacity that can be enhanced by formal and informal mindfulness training (Brown & Ryan, 2003; Ryan & Brown, 2003). Thus, a mindfulness-based intervention that enhances trait mindfulness may benefit students in the long term by nurturing a stable and noncontingent self-concept.

The effect of a specific mindfulness meditation may depend on the trait level of mindfulness (Davidson & Kaszniak, 2015). Thus, I examined the interaction between the short-term mindfulness meditation and trait mindfulness. There was a significant interaction between

audio type and trait mindfulness. For the mindfulness group, the lower one's trait mindfulness, the stronger effect the mindfulness meditation audio instruction had on improving participants' self-concept. Although surprising, I speculated that this was because the experience of observing one's thoughts and feeling non-judgmentally was not something people with low trait mindfulness normally do. Thus, a meditation that instructs people with lower levels of trait mindfulness to do so may be very beneficial.

This result can help to refine our understanding of the effect and mechanisms of mindfulness meditation for people with different levels of trait mindfulness. There are many kinds of guided meditation (e.g., focused attention meditation, open monitoring meditation, loving-kindness meditation) and practitioners with different levels may react to them differently. Practitioners may even react to the same guided meditation differently. For example, within the same meditation practice that requires one's attention to focus on breathing, novices may find the instructions very difficult to follow. Thus, they may feel frustration and their attention may wander quite frequently. In contrast, experienced mediators may find instructions easy to follow and will not feel frustration, and their higher attention quality reduces the frequency of mind-wandering. Thus, a given guided meditation may have different effects on the same outcomes such as emotion and attention for novices and experienced meditators. Future research should focus more on the interaction between trait mindfulness and a short-term guided meditation in various situations. Studies that examine the moderated mediation effect for different types of meditation guidance will be useful to further the understanding of the nuance and subtle effect of mindfulness on various outcomes across different groups of people.

CHAPTER 8. STUDY 2

Based on the discussion that mindfulness nurtures an open and non-judgmental way for people to relate to their experience, I expected that after a brief mindfulness intervention, students should have a lower tendency to self-handicap. Similarly, because self-compassion nurtures a non-critical and balanced way for people to relate to their experience, I expected that after a self-compassion intervention, students should have a lower tendency to self-handicap. Indeed, trait procrastination has a negative correlation with trait mindfulness (Sirois & Tosti, 2012) and self-compassion has a negative correlation with self-report self-handicapping behaviors (Akin & Akin, 2015; Petersen, 2014). These findings demonstrated that both mindfulness and self-compassion may prevent self-handicapping behaviors. Yet no previous studies have examined the causal effect of mindfulness intervention and self-compassion intervention on self-handicapping behaviors.

The main goal for Study 2 was to test experimentally if a short mindfulness meditation or a short self-compassion meditation helped students to lower their self-handicapping behavior in an evaluative situation. I hypothesized that both the short mindfulness meditation and the self-compassion meditation would help students to lower their self-handicapping behavior in an evaluative situation.

Method

Participants

One thousand and forty-seven undergraduates from a Midwestern university in the United States participated in this study to get course credit in introductory psychology classes. The mean age was 19.24 ($SD = 1.5$). Among the participants, 410 were male, 612 were female, and 25 participants didn't report gender. The distribution of males in each of the three conditions

ranges from 38.7.2% to 41.5%. Among the students, 82.5% were white, 3.2% were African American, 4.1% were Asian/Pacific Islander, 4.7% were Latino/Hispanic, 2.6% were Multi-Racial, 0.2% were other race, also 2.6% didn't report race.

Study Design

This was a between-subjects design experiment. There were three groups in the study, a mindfulness group, a self-compassion group, and a control group. The dependent variable was students' self-handicapping behaviors or reported self-handicapping.

Procedure

Graphic illustration of Study 2 is shown in Figure 6. All participants completed the Five Facet Mindfulness Scale (Baer et al., 2006) before the audio intervention. Participants were randomly assigned to listen to an audio recording to meditate, an audio recording to practice self-compassion, or no audio instructions. After the audio intervention, all participants were told that the next task (3-digit multiplication problems) was predictive of future cognitive abilities and success in math, and they would receive feedback on their performance. Participants then had 15 minutes before the task began, and they were told that practice of solving the questions would enhance their performance, but they were not required to practice. The participants could determine the length of their practice independently. If participants wanted to do something else, they had other options such as playing Tetris or solving a puzzle to entertain themselves during the 15 minutes before the real task. The time spent on preparation or other activities was recorded via an application that keep track of the length of different screen activities. Participants were not aware of this recording during the preparation. Self-handicapping was measured by the time participants distract themselves from preparing for the task (i.e., time not spent on practicing math problems during the 15 minutes). Participants were given another opportunity to self-handicap through selection of the type of music they would listen to while taking the math

test. They selected among tapes labeled and numbered from “very facilitating” (1) to “very distracting” (7). The tape at value 4 was labeled “neutral.” Thus, higher values indicated more self-handicapping. Participants carried out the 3-digit multiplication problems that they would prepare for and received a feedback about their accuracy rate. Participants also completed another self-handicapping measure (Academic Self-handicapping Scale, Urdan & Midgley, 2001), a desire to escape questionnaire (Hodgins et al., 2006) and a demographic questionnaire. Participants received debriefing information after all previous procedures.

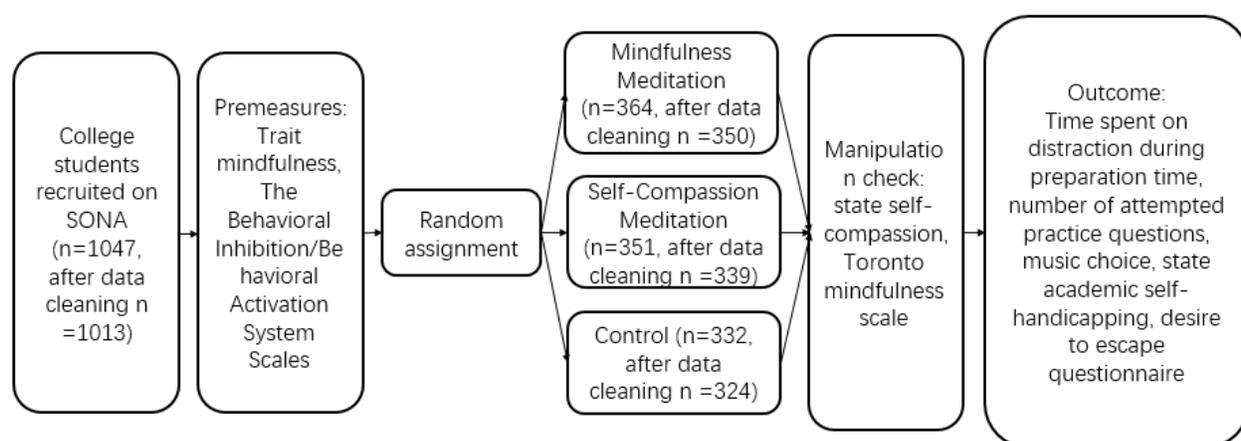


Figure 6. Graphic illustration of Study 2.

Pre-experimental Measures

The Five Facet Mindfulness Questionnaire (Appendix B1). The Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006) was the same one from study 1. The coefficient alpha was 0.87 for The Five Facet Mindfulness Questionnaire in this study.

The Behavioral Inhibition/Behavioral Activation System Scales (Appendix B2). This scale (BIS/BAS Scales; Carver & White, 1994) was used to measure behavioral inhibition system reactivity to aversive stimuli and three types of behavioral activation system reactivity to anticipated/ acquired rewards. This scale (20 items) includes 4 domains, BIS (7 items), BAS—Reward Responsiveness (5 items), BAS—Drive (4 items) and BAS—Fun Seeking (4 items).

Samples items include, “Criticism or scolding hurts me quite a bit.” (BIS), “When I get something I want, I feel excited and energized.” (BAS—Reward Responsiveness), “When I want something I usually go all-out to get it.” (BAS—Drive), and “I’m always willing to try something new if I think it will be fun.” (BAS—Fun Seeking). Items were rated on a Likert scale from 1 (strongly agree) to 4 (strongly disagree). After reverse scoring most of the items (i.e., 18 items out of the 20 items need to be reverse scored), a higher score indicated a higher level of BIS/BAS. The coefficient alphas were BIS scale (0.74), BAS scale (0.73), BAS-RR (0.73), BAS-D (0.76) and BAS-FS (0.66) among college students in the United States (Carver & White, 1994). BIS was used in this current study with Cronbach’s alpha 0.81. Construct validity was evidenced through a positive correlation with negative affect in college students (Atkinson, Sharp, Schmitz, & Yaroslavsky, 2012).

Experimental Conditions

The three conditions were: mindfulness meditation, self-compassion meditation, and control.

The Mindfulness Intervention (Appendix A4). The mindfulness task involved listening to a 12-min recorded instruction that focuses on breath meditation. A part of the instructions is shown below.

“...Notice your body. Notice how it moves when you breathe. Where do you feel the breath? Some people notice it at the nostril, some people at the back of the throat, some people in the chest, some people in the belly. It doesn’t really matter where it is, what matters is you are noticing what you are actually experiencing...”

This mindfulness meditation was similar to typical mindfulness practices. It fostered a non-judgmental observation towards one’s experiences such breathing, listening, and body sensations.

The Self-Compassion Intervention (Appendix A5). The self-compassion intervention involved listening to a 12-min self-compassion. A part of the instructions is shown below.

“... What we are going to do now is to repeat some phrases, and these phrases are designed to help you feel compassion for the fact that people aren’t everything they wish they were, and we do make mistakes. And you certainly try your best, but no one on this planet is perfect. And we all make mistakes, that’s the human experience. That’s ok, it’s actually ok to make all the mistakes...”

The goal of this self-compassion contemplation was to help students nurture caring and compassionate feelings towards the self when are faced with difficulty situations or perceived inadequacy.

The Control Intervention. The control group did not get any intervention. They moved on to the next part of the study after the pre-measures.

Manipulation check measures

The State Self-Compassion Scale (Appendix B4). The state self-compassion scale (Breines & Chen, 2013) was adapted from the self-compassion scale (SCS; Neff, 2003b). It was shortened to 16 items and was used to measure how they reflect current feelings regarding the recalled negative event. The scale included at least two items from each subscale in the self-compassion scale to capture the full breadth of the original scale. Samples items included “I’m trying to be kind and reassuring to myself”, “A lot of people have negative experiences, I’m not the only one”, and “I’m taking a balanced perspective on the situation”. Items were rated on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). A higher score indicated a higher level of state self-compassion. The coefficient alphas were 0.76 among college students in the United States (Breines & Chen, 2013) and 0.81 in this study. Construct validity of the state self-

compassion scale was evidenced through a significant positive correlation with trait self-compassion among college students (Breines & Chen, 2013).

The Toronto Mindfulness Scale (Appendix B3). The Toronto Mindfulness Scale (TMS; Lau et al., 2006) was used to measure state mindfulness. This scale (13 items) included two domains, curiosity and decentering. Samples items included, “I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations” (curiosity), “I was curious to see what my mind was up to from moment to moment” (curiosity), “I experienced myself as separate from my changing thoughts and feelings” (decentering), and “I was more concerned with being open to my experiences than controlling or changing them” (decentering). Items were rated on a Likert scale from 0 (not at all) to 4 (very much). A higher score indicated a higher level of state mindfulness. Reliability estimates of the composites, analogous to a coefficient alpha for internal consistency for the scales, were .86 and .87 (Lau et al., 2006). The Cronbach’s alphas were 0.90 for curiosity and 0.76 for decentering in this study. Construct validity of TMS was evidenced through a positive correlation between curiosity and increased reappraisal and a positive correlation between decentering and improvements in clinical outcome (Garland, Hanley, Farb, & Froeliger, 2015; Lau et al., 2006). TMS scores also increased with increasing mindfulness meditation experience (Lau et al., 2006).

Post-experimental Measures

Behavioral self-handicapping. Behavioral self-handicapping was measured by participants’ behavior during the 15-minute preparation time before the math test (Appendix B6). Self-handicapping was measured by the time participants distracted themselves from preparing for the task (i.e., time not spent on practicing math problems during the 15 minutes) and the number of questions attempted during the preparation time. A longer time spent on distraction

activities and fewer items attempted by the participants indicated more self-handicapping.

Participants' screen activities were recorded by an app called "Activity Watch."

The screen activities records were coded by two research assistants to calculate the time usage during the 15-minute preparation time. The activities were categorized into five groups: time spent on Qualtrics page, time spent on Tetris game page, time spent on Puzzle game page, away from keyboard time, and time spent on other activities. A high degree of inter-rater reliability was found between the two coders. The average measure ICC for Qualtrics page ($n=921$) time was 0.951 with a 95% confidence interval from 0.944 to 0.957. The average measure ICC for Tetris page time ($n=921$) was 0.938 with a 95% confidence interval from 0.929 to 0.945. The average measure ICC for Puzzle page time ($n=922$) was 0.931 with a 95% confidence interval from 0.921 to 0.939. The average measure ICC for away from keyboard time ($n=922$) was 0.909 with a 95% confidence interval from 0.896 to 0.920. The average measure ICC for time spent on other activities ($n=922$) was 0.705 with a 95% confidence interval from 0.664 to 0.741. With the average measure ICC values higher than 0.7 for all the activities, the two coders had a good inter-rater reliability. The time spent on each activity was calculated by averaging the results given by the two research assistants. The total self-distraction time were calculated by adding Tetris page time, Puzzle page time, and time spent on other activities together.

Participants were given another opportunity to self-handicap through selection of the type of music they would listen to while taking the math test (Appendix B5). They selected among tapes labeled and numbered from "very facilitating" (1) to "very distracting" (7). The tape at value 4 was labeled "neutral." Thus, higher values indicated more self-handicapping.

Self-Report Self-handicapping (Appendix B7). It was measured using a 6-item measure (Urduan & Midgley, 2001). An example item is “Some students put off doing their schoolwork until the last minute so that if they don’t do well on their work they can say that is the reason how true is this of you?” Items were rated on a Likert scale from 1 (“Not at all true”) to 5 (“Very true”). For this study, the questions were modified in a way to reflect the state self-handicapping tendency, for example one of the modified items was “Imagine you have important work to do right now, how much do you want to put off work until the last moment so that you will have a reason if you don’t do as well as hoped?” The coefficient alphas were 0.76 for state academic self-handicapping in this study.

The Desire to Escape questionnaire (Appendix B8). The Desire to Escape questionnaire (DTEQ; Hodgins et al., 2006) was used to measure participants’ desire to engage in four behaviors that can be used to escape what was happening in the current moment. Items include, “go to sleep”, “leave the study”, “smoke a cigarette”, and “drink alcohol”. Items were rated on a Likert scale from 0 (not at all) to 14 (extremely). A higher score indicated a higher level of desire to engage in behaviors that can be used to escape. The coefficient alpha was 0.46 in this study. Construct validity of DTEQ was evidenced through autonomy-primed participants showed less desire to escape compared to control-primed participants (Hodgins et al., 2006).

Demographic Questionnaire (Appendix B9). The demographic questionnaire contained questions about participants’ age, gender and previous meditation experience, such as if participants had meditation experience, the frequency of meditation practice, and the average length of the meditation practice.

Data Analyses

The analyses, such as descriptive statistics and one-way multivariate analysis of variance (i.e., one-way MANOVA), were conducted in SPSS 20.0.

Results

Preliminary Analyses

Thirty-four participants failed at least two out of five attention checks in the study and were therefore excluded from the analysis. The three groups did not differ in terms of age ($F(2, 992) = 0.062, p > .05$), gender ($\chi^2(2, N=994)=0.310, p>0.05$), ethnicity ($\chi^2(12, N=991)=14.314, p>0.05$), previous meditation experience ($\chi^2(2, N=997)=2.701, p>0.05$), meditation practice frequency ($\chi^2(6, N=325)=3.807, p>0.05$), and average meditation practice length ($\chi^2(8, N=326)=5.578, p>0.05$).

Main Analyses

An ANOVA demonstrated that, as intended, the self-compassion audio intervention significantly influenced participants' self-compassion level ($F(2, 1010) = 3.785, p < .05$, partial $\eta^2 = .007$). Participants reported the highest level of state self-compassion in the self-compassion mediation condition ($M = 5.10, 95\% CI [5.02, 5.17]$), followed by the mindfulness condition ($M = 5.05, 95\% CI [4.98, 5.12]$), followed by the control condition ($M = 4.95, 95\% CI [4.87, 5.03]$). Planned contrasts revealed significant difference between self-compassion group and control group ($p = 0.07$) and not between other pairs of groups. Thus, the manipulation of inducing self-compassion was successful.

An ANOVA demonstrated that the mindfulness audio intervention significantly influenced participants' decentering level ($F(2, 1010) = 5.052, p = 0.007$, partial $\eta^2 = .010$). Participants reported similar level of decentering in the mindfulness mediation condition ($M = 2.07, 95\% CI [2.00, 2.14]$) and self-compassion condition ($M = 2.09, 95\% CI [2.02, 2.17]$). Participants reported the lowest level of decentering in the control condition ($M = 1.94, 95\% CI [1.87, 2.01]$). Planned contrasts revealed significant differences between mindfulness group and control group ($p = 0.012$) and between self-compassion group and control group ($p = 0.003$).

Thus, the manipulation of inducing mindfulness was successful in the mindfulness group. Self-compassion intervention also increased decentering in this study. The curiosity subscale score in Toronto Mindfulness Scale didn't show group difference.

Table 2. Means, Standard Deviations, Skewness, Kurtosis, and Zero-Order Correlations for Dependent Variables and State Self-compassion

	1	2	3	4	5	6	7	8
1. Music Choice	-----							
2. Self-distraction time	.07*	-----						
3. Practice number	-.06*	-.55***	-----					
4. State ASH	.09**	.06	-.07*	-----				
5. DTEQ	.07*	.16**	-.16***	.31***	-----			
6. Square root of Practice number	-.06	-.57***	.94***	-.06	-.15***	-----		
7. Square root of State ASH	.09**	.06	-.07*	.99***	.31***	-.06	-----	
8. State self-compassion	-.06*	-.06	.05	-.23***	-.26***	.05	-.23***	-----
Possible Range	1-7	0-900	0-40	1-5	0-14	0-6.32	0-2.24	1-7
Actual Range	1-7	0-900	0-40	1-5	0-14	0-6.32	0-2.24	2.06-6.94
Mean	3.67	247.04	6.63	1.96	4.64	2.11	1.38	5.03
SD	1.81	287.68	6.21	0.73	2.11	1.48	0.25	0.70
Skewness	0.24	0.74	1.06	1.06	0.46	-0.18	0.63	-0.323
Kurtosis	-0.80	-0.82	2.07	1.08	0.57	-1.06	-0.004	0.496

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

The correlations among dependent variables were calculated. As demonstrated in Table 2, practice number and state ASH were both associated with high skewness. Therefore, a square-root transformation was applied to these two variables. To further explore the relations among dependent variables, correlations among dependent variables were examined across different conditions. As demonstrated in Table 3, the correlation pattern among dependent variables across the three experimental conditions are very similar except for one specific correlation. The correlation between self-distraction time and desire to escape was not significant in the control group, but was significant in both mindfulness group and self-compassion group. This indicated that self-distraction time and desire to escape covaried to a greater extent in the groups with an

audio intervention compared to the group that did not get an audio intervention. This may be explained by the fact that audio intervention took participants 10 minutes to finish, so they might be more tired, or engaged more with distracting activities during the task preparation, and wanted to escape the current experiment to a greater extent.

Table 3. Zero-Order Correlations for Dependent Variables across Experimental Groups

	1	2	3	4	5
Correlations for the Mindfulness Group					
1. Music Choice	-----				
2. Self-distraction time	.07	-----			
3. DTEQ	.02	.20***	-----		
4. Square root of Practice number	-.01	-.60***	-.09	-----	
5. Square root of State ASH	.04	0.07	.28***	-.03	-----
Correlations for the Self-Compassion Group					
1. Music Choice	-----				
2. Self-distraction time	.05	-----			
3. DTEQ	.09	.15**	-----		
4. Square root of Practice number	-.08	-.55***	-.18**	-----	
5. Square root of State ASH	.13*	.05	.27***	-.06	-----
6. State self-compassion	-.06	-.08	-.27***	.07	-.15**
Correlations for the Control Group					
1. Music Choice	-----				
2. Self-distraction time	.09	-----			
3. DTEQ	.10	.10	-----		
4. Square root of Practice number	-.10	-.55***	-.17**	-----	
5. Square root of State ASH	.10	.07	.38***	-.10	-----
6. State self-compassion	-.10	-.09	-.31***	.10	-.36***

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

Most of the intercorrelations among transformed variables and other three variables (i.e., music choice, self-distraction time, desire to escape) in Table 2 were significant and are at the low to moderate level, suggesting the appropriateness of a MANOVA. In addition, the result of Box's test of equality of covariance ($F=0.900$, $p=0.623$) indicated that the observed covariance matrices of the dependent variables are equal across groups. A one-way multivariate analysis of covariance (MACNOVA, covariates of FFMQ and BIS were included) was conducted to test the hypothesis that there would be one or more mean differences between experimental conditions (mindfulness, self-compassion, and control) and self-handicapping. There was a statistically

significant difference in self-handicapping behavior based on intervention, $F(10, 1810) = 1.880$, $p = 0.044$; Wilk's $\Lambda = 0.980$, partial $\eta^2 = .01$, which implied that 1% of the variance in the canonically derived dependent variable was accounted for by experimental condition. Prior to conducting a series of follow-up ANCOVAs, the homogeneity of variance assumption was tested for all five self-handicapping measurements. Based on a series of Levene's F tests, the homogeneity of variance assumption was considered satisfied (see Table 3). A series of one-way ANCOVAs on each of the nine dependent variables was conducted as follow-up tests to the MANCOVA. As can be seen in Table 4, condition had a statistically significant effect on the choice of music ($F(2, 909) = 4.633$; $p = .010$; partial $\eta^2 = .010$) and on the desire to escape questionnaire ($F(2, 909) = 3.841$; $p = .022$; partial $\eta^2 = .008$). The other dependent variables (i.e., self-distraction time, practice question number, state self-reported academic self-handicapping) were not significantly different among groups.

Table 4. *One-Way ANCOVA's With Self-Handicapping as Dependent Variables and Experimental Condition as Independent Variables*

	Levene's		ANCOVAs			Mindfulness		Self-Compassion		Control	
	$F_{(2,911)}$	p	$F_{(2,909)}$	p	η^2	M	SD	M	SD	M	SD
1. Music Choice	0.831	0.436	4.633	0.010	0.010	3.75	1.827	3.45	1.779	3.79	1.809
2. Self- distraction	0.421	0.657	0.163	0.850	0.00	247.057	284.341	254.167	294.329	239.5017	284.98 9
3. Transformed practice number	2.252	0.106	0.177	0.838	0.00	2.124	1.479	2.056	1.535	2.151	1.416
4. Transformed state ASH	2.722	0.066	1.320	0.268	0.003	1.388	0.260	1.379	0.250	1.367	0.243
5. DTEQ	1.207	0.299	3.841	0.022	0.008	4.776	2.185	4.717	2.064	4.430	2.071

Note. Covariates of FFMQ and BIS were included for ANCOVAs, M s and SD s were raw numbers without adjusting for the two covariates.

Further analyses show that mean scores for distracting music choice were statistically significantly different between self-compassion group and control group ($p = .009$, $d = 0.190$), and between meditation group and self-compassion group ($p=0.008$, $d = 0.166$), but not between meditation group and control group ($p = 0.977$, $d = 0.022$). After controlling for FFMQ score and BIS score, The self-compassion group generally selected more facilitating music ($M = 3.400$, $SE = 0.102$) to listen to, compared to the mindfulness group ($M = 3.778$, $SE=0.100$) and the control group ($M = 3.782$, $SE=0.104$). Mean scores for desire to escape questionnaire were statistically significantly different between the mindfulness group and the control group ($p = .007$, $d = 0.163$), but not between the mindfulness group and the self-compassion group ($p = 0.439$, $d = 0.028$), nor between the self-compassion group and the control group ($p = 0.055$, $d = 0.139$). After controlling for FFMQ score and BIS score, the control group generally reported lower scores on the desire to escape questionnaire ($M = 4.352$, $SE = 0.119$), compared to the mindfulness group ($M = 4.798$, $SE=0.115$) but not compared to the self-compassion group ($M = 4.672$, $SE=0.116$).

Discussion

To the author's knowledge, this study provided the first experimental evidence to demonstrate that a short self-compassion meditation was effective in reducing self-handicapping behaviors. Compared to the control group, the self-compassion group chose to listen to less distracting music when led to believe that the task performance was indicative of their ability. In the current study, 72% of the participants believed that the math test they took reflected their cognitive abilities to some extent. Empirical evidence has shown that self-handicapping is likely to happen when people believe that task performance is indicative of their ability (Thomas & Gadbois, 2007; Ferrari & Tice, 2000). The situation created in Study 2 could increase students' likelihood

to engage in self-handicapping behaviors such as choosing distracting music to listen to during the math test, so that they can attribute potential failure to the music and protect their academic self-concept. For a student to engage in self-handicapping behaviors, the student needs to interpret their performance on a specific task as a reflection of academic ability that they care about. There was indirect evidence that participants in Study 2 interpreted their performance on the math task as a reflection on their math ability. In the current study, 72% of the participants believed that the math test they took reflected their cognitive abilities to some extent. Also, all participants were told that the next task (3-digit multiplication problems) was predictive of future cognitive abilities and success in math. Previous research has also shown that American college students generally believed that math was important and useful (Wismath & Worrall, 2015). So, this indirect evidence indicates that participants in Study 2 cared about their ability in the math and they interpreted their performance in the math task as an indicator of math ability. As a result, participants in Study 2 should care about their perceived math ability to conduct self-handicapping behaviors. Nonetheless, direct evidence of students' interpretation of whether they believed that their performance reflected an important academic ability was not collected in the study. This was a limitation of Study 2. Even though the experiment was set up to create the best scenario for participants to engage student behavior, participants' perception and interpretation of the experimental setting might be different from researcher's expectation. Such information should be collected in future studies.

A self-compassion meditation as short as 12 minutes, however, was able to lower the tendency for participants to choose distracting music during the math test. Participants in the self-compassion meditation group chose more facilitating music to listen to during the math test. They were not as concerned as the other two groups about protecting their academic self-concept

through a self-handicapping strategy at the cost of distracting themselves, even when the test performance would be indicative of their cognitive abilities.

Another interesting finding was that mindfulness increased students' score on desire to escape scale after the math task. This is at odds with what mindfulness is theorized to do – to make people more accepting of their present-moment experience. Given the low coefficient alpha for the desire to escape questionnaire, it was possible the measurement didn't have a good internal reliability of detecting the desire to escape at the moment. So, a closer examine of each item was needed. Another MANOVA (with no covariates) was conducted with the four items in the questionnaire as the dependent variables. There was a statistically significant difference in self-handicapping behavior based on experimental condition, $F(8, 1972) = 2.126, p = 0.030$; Wilk's $\Lambda = 0.983$, partial $\eta^2 = .009$, which implies that 0.9% of the variance in the canonically derived dependent variable was accounted for by experimental condition. The following ANOVA (with no covariates) indicated that condition only had a statistically significant effect on one item: desire to leave the study at the moment ($F(2, 989) = 7.615; p = .001$; partial $\eta^2 = .015$). The control group reported lower level of desire to leave the study ($M = 8.028, SE = 0.203$) compared to the mindfulness group ($M = 8.876, SE = 0.197$) and compared to the self-compassion group ($M = 9.075, SE = 0.199$). This result might be attributed to the fact that control group didn't conduct the audio-listening task and had spent less time at that point of the study, and might be less tired compared to the mindfulness group.

As for the other three dependent variables: self-distraction time during the preparation, the amount of questions practiced during the preparation, and the self-reported state academic self-handicapping, none of them were significant in the MANCOVA results. This might be due to a lack of sensitivity in the measurement of self-reported state academic self-handicapping and

a lack of precision in the measurement of self-distraction time during the preparation. In the current study, self-reported state academic self-handicapping was adapted from the original trait version of academic self-handicapping tendencies. It may lack the sensitivity to detect any nuanced changes in state self-handicapping tendency. Also, self-distraction was measured by the screen behavior conducted by the participants during the 15-minute preparation period. This measurement may not be precise enough to record participants' attention second by second. For example, a student might stay on the page of Qualtrics which showed the practice problems but was not spending effort solving the problems. The amount of questions practiced during the preparation period might be confounded by students' math abilities. Better measurement tools should be developed for the future study of self-handicapping behaviors.

Nevertheless, this study still showed that a short self-compassion meditation was effective in reducing certain self-handicapping behaviors. Such findings can be applied to college education settings. Educators and instructors may wish provide information about self-compassion to students, and these types of guided contemplations can be used by college students directly to lower their self-handicapping behaviors. Future research may also examine the effect in non-academic. More research is needed to examine the mechanisms accounting for the mitigating effect of self-compassion meditation on self-handicapping behavior. Based on previous discussion, self-concept instability is a potential mediator in the process.

CHAPTER 9. STUDY 3

Study 3 was designed to explore the potential mediation effect of self-concept instability in the relation between audio intervention and self-handicapping behaviors. In this study, I examined the mediating effect of self-worth contingency, a conceptual indicator of participants' self-concept instability, on the relation between intervention types and the choice of less distracting music.

Mindfulness should lower students' self-worth contingency based on discussion given in Chapter 5. I therefore expected that a short mindfulness meditation should help students to lower their contingency of self-worth, which should in turn reduce self-handicapping behavior. Similarly, based on the discussion that self-compassion should lower students' self-worth contingency, I expected that a short self-compassion meditation should help students to lower their contingency of self-worth, which then would reduce self-handicapping behavior. I also hypothesized that a short mindfulness meditation would behave the same way; it would help students to lower their contingency of self-worth, which then should reduce self-handicapping behavior.

The primary goal of study 3 was to investigate if a short mindfulness meditation and a short self-compassion meditation helped students to lower their contingency of self-worth, which then reduced self-handicapping behavior.

Method

Participants

Six hundred and thirteen participants in Study 2 also participated in study 3, because I wanted to further research the potential mediation effect. To be specific, these six hundred and thirteen participants answered one more scale in addition to all other tasks in Study 2 to examine

the mediating effect in Study 3. Undergraduates from a Midwestern university in the United States participated in this study to get course credit in introductory psychology classes. The mean age was 19.4 ($SD = 1.7$). Among the participants, 219 were male, 382 were female, and 12 participants didn't report gender. Among the students, 83.2% were white, 3.1% were African American, 3.8% were Asian/Pacific Islander, 4.2% were Latino/Hispanic, 0.2% were Native American, 3.1% were Multi-Racial, also 2.4% didn't report race.

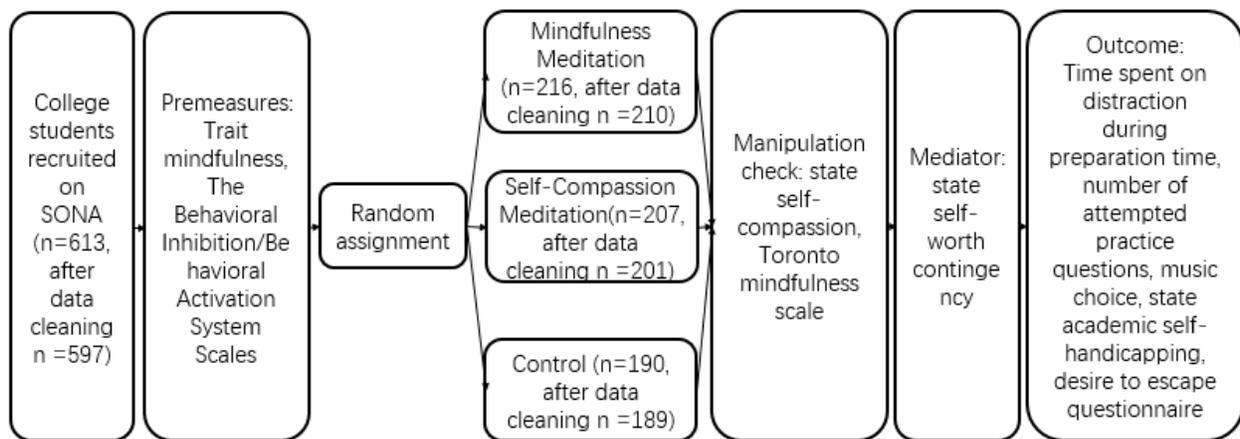


Figure 7. Graphic illustration of Study 3.

Study Design

This was a between-subjects design experiment. There were three groups in the study, a mindfulness group, a self-compassion group, and a control group. The dependent variable was students' self-handicapping behaviors of selecting distracting music during the math test. There was a mediating variable (i.e., academic self-worth contingency) measured after the study manipulation and before the dependent variable measurement.

Procedure

The study procedure was very similar to study 2. I added one step in study 3 - the participants filled out a state version of self-worth contingency scale after they heard the

explanations about how the math task was predictive of future cognitive abilities and success in math, and that they would receive feedback on their performance. Graphic illustration of Study 3 is shown in Figure 7.

Pre-experimental Measures

The pre-experimental measures in study 3 were identical to those in study 2. There were The Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006) and The Behavioral Inhibition/Behavioral Activation System Scales (BIS/BAS Scales; Carver & White, 1994).

Experimental Conditions

The experimental conditions in study 3 were identical to those in study 2.

Mediating Effect Measures

Contingencies of Self-Worth Scale (Appendix B10). This scale contains 35 items and measures participants' tendency to depend self-worth on four aspects: academic competence, competition, appearance, god's love, virtue, and family support. In this study participants will respond to 5 items that measures the extent to which one's self-worth depends on their performance in academia (Crocker, Luhtanen, Cooper, & Bouvrette, 2003). An example item for academic competence is "My opinion about myself isn't tied to how well I do in school". For this study, the questions are modified in a way to reflect the state self-worth contingency, for example one of the modified items is "My opinion about myself may be influenced by how well I do in this academic task." The coefficient alpha was 0.89 in this study.

Post-experimental Measures

All the post-experimental measures in study 3 were identical to those in study 2.

Data Analyses

The mediation analysis was conducted in SPSS 20.0 using PROCESS (Hayes, 2017).

Results

Preliminary Analyses

The three groups did not differ in terms of age ($F(2, 584) = 0.207, p > .05$), gender ($\chi^2(2, N=587)=0.992, p>0.05$), ethnicity ($\chi^2(10, N=584)=6.581, p>0.05$), previous meditation experience ($\chi^2(2, N=587)=0.927, p>0.05$), meditation practice frequency ($\chi^2(6, N=196)=8.674, p>0.05$), or average meditation practice length ($\chi^2(8, N=197)=4.194, p>0.05$). The descriptive statistics for Study 3 are shown in Table 5.

Table 5. *Descriptive statistics for Study 3*

	Academic self-worth contingency (<i>M</i>)			Music choice (<i>Y</i>)		
	\bar{M}	<i>SD</i>	\bar{M}^*	\bar{Y}	<i>SD</i>	\bar{Y}^*
Mindfulness (n=210)	4.310	1.356	4.323	3.73	1.83	3.72
Self-compassion(n=201)	4.456	1.344	4.438	3.42	1.78	3.42
Control (n=185)	4.481	1.386	4.486	3.74	1.84	3.74
All groups	4.412	1.361	4.415	3.63	1.82	3.628

Note. \bar{M}^* = adjusted mean, adjusted to the sample means of covariates (FFMQ and BIS drive). \bar{Y}^* = adjusted mean, adjusted to the sample means of academic self-worth contingency and covariates.

Main Analyses

All the participants' response in Study 3 were already included in Study 2. These are not two independent samples; the study materials were also basically the same. So, the effectiveness audio intervention has already been supported in Study 2 analysis. The main goal of Study 3 was to examine the mediating effect of self-worth contingency in the relation between audio intervention and self-handicapping. So, a one-way ANCOVA (FFMQ and BIS were covariates) was conducted to examine the effect of audio intervention on music choice. The result revealed that condition didn't have a statistically significant effect on the choice of music ($F(2, 589) =$

2.141; $p = .118$; partial $\eta^2 = .007$). This was different from the result from Study 2. The discrepancy may be caused by lower power in Study 3.

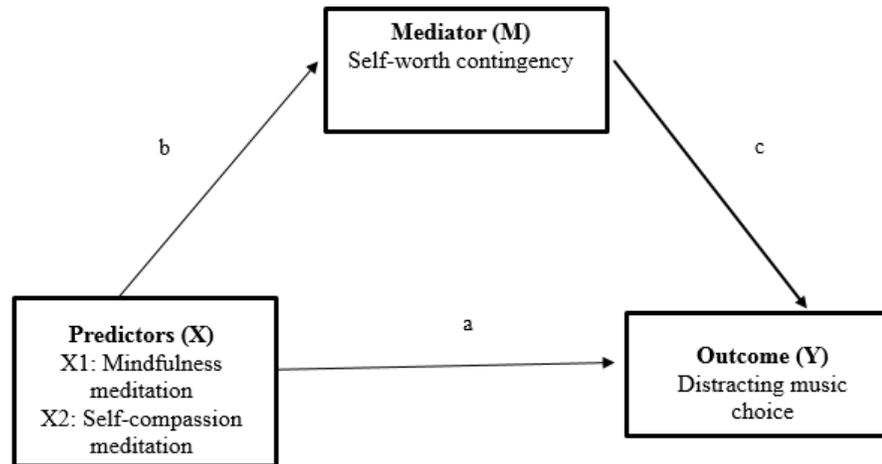


Figure 8. The conceptual model for mediation analysis.

Note. BIS and FFMQ are covariates in this model.

The hypothesized model (Figure 8) included indirect (mediation) effects from study manipulation (X as the predictor) to the distracting music choice (Y as the dependent variable) through academic self-worth contingency (M as the mediator). Path coefficients for mediation analysis was shown in Table 6. The results indicated that self-worth contingency did not mediate the association between experimental manipulation and distracting music choice. Bootstrap confidence intervals were used to determine the significance of indirect effect. This method does not assume normality of the sampling distribution of the relative indirect effect (Hayes & Preacher, 2014). Based on the analysis result of 5000 bootstrap samples, the 95% bootstrap CIs were used to examine the relative indirect effects. Mindfulness condition (relative to the control condition) did not indirectly influence the choice of music through state academic self-worth contingency (Mindfulness condition, $b = -0.003$, $SE = .007$, 95% CI [-0.020, 0.011]). In addition, self-compassion condition (relative to the control condition) also did not indirectly influence the

choice of music through state academic self-worth contingency (Self-compassion condition, $b = -0.001$, $SE = .005$, 95% $CI [-0.014, 0.010]$).

Table 6. *Path Coefficients for Mediation Analysis*

Variable	Path	B	SE B	β	t	p	95% CI
Mediator (M): Self-worth Contingency ($R^2 = .335$, $F(4,588) = 18.53$, $p < .0001$)							
Constant	a0	2.96	.65	0.05	4.54	.00	[1.68, 4.24]
Predictor (X1): Mindfulness Meditation	a1	-0.16	.13	-0.12	-1.25	.21	[-0.42, 0.09]
Predictor (X2): Self- Compassion Meditation	a2	-0.06	.13	-0.04	-0.43	0.67	[-0.32, 0.20]
Covariate: BIS drive		0.72	0.10	0.30	7.26	0.00	[0.53, 0.92]
Covariate: Trait Mindfulness		-0.23	0.14	-0.07	-1.63	0.10	[-0.52, 0.05]
Outcome (Y): Distracting Music Choice ($R^2 = .210$, $F(5,587) = 5.409$, $p = 0.0001$)							
Constant	b0	7.39	0.92	0.06	-0.10	.00	[5.59, 9.20]
Mediator (M): Self-worth Contingency	b1	0.03	.06	0.02	0.53	.59	[-0.08, 0.14]
Predictor (X1): Mindfulness Meditation	c1'	-0.02	.18	-0.01	-0.10	.92	[-0.38, 0.34]
Predictor (X2): Self- compassion Meditation	c2'	-0.32	.18	-0.18	-1.76	0.08	[-0.68, 0.04]
Covariate: BIS drive		-0.66	.14	-0.20	-4.58	0.00	[-0.94, -0.38]
Covariate: Trait Mindfulness		-0.53	0.20	-0.11	-2.65	0.01	[-0.93, -0.14]

Note. $N = 593$. CI = Confidence Interval.

Discussion

The mediating effect of self-worth contingency was not found in the current study. The self-compassion group in this study did not choose more facilitating music compared to the control group in this study. This was different from the Study 2 result, where the difference was significant. So, it is possible that with fewer participants, I had lower power to detect experimental differences.

To explore the mechanism underlying mitigating effect of self-compassion meditation on self-handicapping behavior, another mediation analysis using Study 2 data was conducted. Since Study 2 had more participants, it had more power to detect the mediation effect. In Study 2, the self-compassion meditation induced a higher decentering level and a higher state self-compassion level and lower self-handicapping. It is reasonable to test if decentering and state self-compassion mediate the effect from self-compassion meditation on distracting music choice. A new mediation model with experimental condition as predictors, decentering and state self-compassion as mediators, and distracting music choice as dependent variable was conducted. The result revealed a significant indirect effect of self-compassion condition (relative to the control condition) on the choice of music through state self-compassion ($b = -0.035$, $SE = .021$, 95% $CI [-0.084, -0.001]$). The indirect effect of self-compassion condition on music choice via decentering was not significant. The indirect effects of mindfulness condition on music choice were also non-significant. Participants in the self-compassion group had higher state self-compassion, which in turn was associated with choosing less distracting music during the math test. The correlation between state self-compassion and other self-handicapping behaviors can also be found in Table 3. Empirically, these results are consistent with previous studies that found a negative correlation between self-compassion and self-handicapping in self-report (Akin & Akin, 2015; Petersen, 2014). Conceptually, this mediation result supports the hypothesis that

self-compassion nurtures a non-critical and balanced way for people to relate to their experience in which defensiveness is unnecessary. The results were evidence that self-compassionate people adopt a more caring emotional stance toward oneself (Neff, 2003a), so they have a stable source of positive self-regard while being less ego reactive and inflated (Neff & Vonk, 2009).

It is still unclear how state self-compassion related to state academic self-worth contingency according to the results of Study 3. In theory, a higher state self-compassion should be related to a lower state self-worth contingency because self-compassionate people have a stable source of positive self-regard which is independent of their performance. Thus, lower state self-worth contingency may play a role in the relation between self-compassion meditation and self-handicapping behavior. The state academic self-worth contingency scale, however, was adapted from a trait-like scale and might not be sensitive enough to detect a small change in state self-worth contingency. Future research that investigates the mediating role of state self-worth contingency may benefit from using a better measure tool of state self-worth contingency and a larger sample size.

CHAPTER 10. GENERAL DISCUSSION AND CONCLUSIONS

General Discussion

Results Integration

Self-handicapping behaviors are prevalent among college students despite their negative effects. The function of self-created impediments to one's performance, stated by previous scholars (e.g. Covington, 2000), is that they facilitate a ready excuse for potential failures to protect their self-concept. This statement about utility of self-handicapping has a premise that students' self-concept is unstable enough to be altered and threatened by daily academic feedbacks. If one's self-concept is always stable, it shouldn't be threatened or damaged and wouldn't need to be protected. On the other hand, if the self-concept is unstable and more easily threatened, there is more need to protect one's self-concept. The relation between academic feedback and self-concept has been demonstrated in a survey study (Guay et al., 2003), but scholars hadn't previously examined the causal effect of academic performance on students' immediate academic self-concept in an experimental setting.

In Study 1, participants' explicit academic self-concept was altered by their performance on a word association test - a performance worse than average lowered participants' academic self-concept, and a performance better than average boosted participant's academic self-concept. Because students were randomly assigned to condition, we can conclude that students' explicit academic self-concept was influenced by the feedback from the academic task. Thus, the feedback of an academic task, even a trivial one, can lead to changes in college students' academic self-concept, at least in a short-term experimental context. This implies that college students on the whole cannot detach their feelings of being competent or incompetent in

academia from specific performance results. This finding is important to understand the prevalence of self-worth protection behaviors among college students.

Students' self-concept is unstable enough to be altered and threatened by individual academic feedback. This is important because the contingency and instability of self-concept may cause individuals to self-handicap (Hirt et al., 1991; Thomas & Gadbois, 2007) and thus, hinder academic performance (Schwinger et al. 2014). Interventions that reduce instability in one's self-concept may also reduce the need to use self-handicapping behaviors to protect the academic self-concept.

I explored the effect of a short-term mindfulness practice on self-concept stability in study 1 but failed to find the stabilizing effect. In theory, mindfulness should stabilize self-concept. That is to say, if students have a high mindfulness level (either trait or state), they should be more likely to observe their inner experiences while undergoing academic evaluations. They should be more able to recognize that their thoughts and feelings change all the time. They should develop the insight that they are not simply what they think or what they feel. As a result, they should not rely as heavily on individual and perhaps, in particular, somewhat artificial experiences to define the self. In Study 1, however, mindfulness didn't stabilize the relation between academic feedback and academic self-concept, demonstrated by the insignificant interaction between audio intervention manipulation and the valence of feedback manipulation. This was different from my prediction. It is unlikely that this is due to the control conditions (relaxation or no audio) were equally effective. The chosen guided mindfulness manipulation was created by the director of mindfulness education at UCLA Semel Institute's Mindful Awareness Research Center (MARC), so we do not have evidence that it is of low quality. It is possible that students resisted the manipulation, but there does not seem to be any evidence of

that. It is also possible that mindfulness alone is not sufficient to stabilize academic self-concepts, at least not in a one-time brief experiment. Another intervention might be potentially more effective, such as self-compassion. Unlike mindfulness, which mainly loosens one's identification with one's inner experience, self-compassion provides a stable source of positive self-regard with evaluations out of the picture (Neff & Vonk, 2009), and indeed, in Study 2, the self-compassion condition was more effective than the mindfulness condition.

It is still worth noting that a short meditation intervention improved students' academic self-concept in Study 1. In Study 1, although the interaction between two experimental manipulations was insignificant, the main effect of audio intervention on self-concept was significant, indicating mindfulness meditation may be useful in improving students' academic self-concept after getting feedback in an evaluative situation. Besides the stability of self-concept, a high level of academic self-concept can also be beneficial. Academic self-concept is a predictor of subsequent academic achievement and can influence students' success and retention in college (Choi, 2005; Guay et al., 2003). A short-term mindfulness meditation helped students to maintain a more competent academic self-concept after they received evaluations, which helped students to nurture a competent self-concept regardless of the feedback. A long-term mindfulness intervention may lead to an improved self-concept in academic evaluations and improve students' subsequent academic achievement and possibility of retention in college.

Also, students with a lower level of trait mindfulness may benefit more from such intervention than students with a higher level of trait mindfulness. In Study 1, there was a significant interaction between audio type and trait mindfulness on academic self-concept. For the mindfulness group, the lower one's trait mindfulness, the stronger effect the mindfulness meditation audio instruction had on improving participants' self-concept. I speculated that this

was because the experience of observing one's thoughts and feeling non-judgmentally was not something people with low trait mindfulness normally do. Thus, a meditation that instructs people with lower levels of trait mindfulness to do so may be very beneficial. More research is needed to examine the effect and mechanisms of mindfulness meditation for students with different levels of trait mindfulness.

Instability in self-concept theoretically increases the necessity for protecting the self-concept, so Study 2 examined interventions that could stabilize students' academic self-concept and that might help to reduce self-handicapping behaviors. I hypothesized that mindfulness and self-compassion both had the potential to stabilize the self-concept, because the former technique loosens one's identification with one's fragmental inner experience and the latter one provides a stable source of positive self-regard.

In Study 2, I tested if a short mindfulness meditation or a short self-compassion meditation helped students to lower their self-handicapping behavior. The results of Study 2 demonstrated that a short self-compassion meditation was effective in reducing participants' selection of distracting music during the math task. Specifically, students who had been randomly assigned to listen to the self-compassion guided meditation selected more facilitating music to listen to, compared to the mindfulness group and the control group. This result has implications for college education settings. Self-compassion is trainable (Neff & Germer, 2013), and can have both short-term benefits as demonstrated here, as well as long-term benefits (e.g., Jazaieri et al., 2012; Neff & Germer, 2013). Educators can provide information and training materials, and students can use these techniques directly to lower their self-handicapping behaviors. Future research may also examine the effect in non-academic situations such as

athletes' self-handicapping behaviors in sports and employee's self-handicapping behaviors at work.

In contrast, the mindfulness meditation was not effective in reducing participants' selection of distracting music during the math task, contrary to the hypothesis. A short-term mindfulness intervention, in this situation, wasn't enough to stabilize self-concept. This result, although unexpected, was in line with the result from Study 1 where mindfulness also did not stabilize the relation between academic feedback and academic self-concept.

The mindfulness meditation used in Study 2 was different from the one used in Study 1. Thus, it is not as simple as we had chosen a poor guided mindfulness manipulation. According to the manipulation check in Study 2, the mindfulness meditation did increase the level of decentering, as expected. Yet lower identification with one's inner experience was not effective in reducing participants' self-handicapping behavior. A mindfulness meditation may not be enough to stabilize self-concept, at least in a short-term experimental situation. In Study 2, the self-compassion intervention also increased decentering, and increased the state self-compassion level. So, state self-compassion may play an important role in reducing self-handicapping behavior, by reducing self-concept instability.

Study 3 was designed to investigate the mediation effect of self-concept instability in the relation between audio intervention and the choice of less distracting music. In this study, self-worth contingency was used to indicate participants' self-concept instability. The instability of self-concept is related to how much people weigh self-evaluative information to form state self-esteem; the more a person's self-worth is contingent on evaluations, the more unstable this individual's self-esteem and self-concept will be (Kernis et al., 1993). I proposed that academic self-worth contingency was the mediator underlying the mitigating effect on self-handicapping. I

predicted that participants in the experimental conditions who reported lower self-worth contingency and would choose less distracting music. Contrary to my prediction, the mediating effect of self-worth contingency was not found. The self-compassion group in this study did not report choosing facilitating music compared to the control group either. This result was in contrast with Study 2, where the effect was significant. So, it was possible that with fewer participants, I had lower power to detect the effect of experimental effect and the mediation effect. The observed power for experimental condition in the ANCOVA was 0.439 in Study 2, which was low. The same issue with low power may also occur with detecting the mediating effect of state self-worth contingency in Study 3.

Since Study 3 was underpowered, I re-analyzed Study 2 (observed power for condition in ANCOVA was 0.741) to examine indirect evidence that may support the mediation effect of self-concept instability in the relation between audio intervention and the choice of less distracting music. The self-compassion condition in Study 2 was effective in raising both state self-compassion and state decentering. State self-compassion and state decentering were used as mediators in the relation between experimental conditions and the music choice. The result revealed a significant indirect effect of self-compassion condition (relative to the control condition) on the choice of music through state self-compassion ($b = -0.035$, $SE = .021$, 95% $CI [-0.084, -0.001]$). The indirect effect of self-compassion condition on music choice via decentering was not significant. There were no significant indirect effects with the mindfulness mediation condition. This was indirect evidence to support the mediating role of a more stable self-concept or less self-worth contingency, because self-compassion is associated with less fluctuation in feelings of self-worth overtime (Neff & Vonk, 2009). Self-compassion may stabilize the self-concept or reduce the contingency of self-worth on individual experiences.

More research is needed to examine if self-compassion stabilizes academic self-concept. A similar study to Study 1, with a self-compassion audio intervention as a condition, would reveal the effect of self-compassion on stabilizing self-concept in an evaluative situation.

Strengths and Limitations

This research was exploratory. Study 1 provided the first experimental evidence that student's self-concepts were unstable enough to be altered by an individual academic feedback. This was also the first study to demonstrate that a short-term mindfulness meditation was enough to help participants to maintain a competent academic situation in an evaluative situation, evidenced by the significant main effect of audio manipulation in Study 1. Nonetheless, I failed to find evidence that a short-term meditation could change the relation between academic feedback and one's immediate academic self-concept (i.e., the stability of self-concept). That is to say, mindfulness meditation did not change the relation between feedback valence and one's academic self-concept, evidenced by the insignificant interaction between audio manipulation and the valence of feedback manipulation in Study 1.

There are other interesting conditions that future researchers could test on both the level and the stability of academic self-concept. Previous research has demonstrated that mastery goal orientation and self-affirmation were both effective in lowering students' self-handicapping behaviors (Schwinger & Stiensmeier-Pelster, 2011; Siegel et al., 2005). Thus, both mastery goal orientation and self-affirmation should be further examined to determine how they affect stabilizing students' academic self-concept. By doing this, scholars will have a better understanding how the instability of one's self-concept relate to self-handicapping behaviors.

This research proposed a framework to explain that self-handicapping behavior is related to the characteristics of self-concept (e.g., instability). Characteristics of self-concept are associated with how an individual relates to one's experience. To be specific, if one evaluates

one's experience against the existing ideas of what the self-concept should be like (i.e., it is usually positive for North Americans), an experience that doesn't fit would become threatening to the self-concept.

Study 2 provided the first experimental evidence that a self-compassion intervention could be effective in reducing participants' selection of distracting music during a potentially threatening math task. Other types of self-handicapping, such as self-reported self-handicapping tendency and inadequate effort spent during task preparation, were not influenced by the self-compassion intervention. It is not surprising to see the behavioral self-handicapping behavior being different from the self-reported tendency. Participants would evaluate and may alter their response during the self-reporting process (Holtgraves, 2004), and the reporting is of prior self-handicapping behaviors. There may also be different types of behavioral academic self-handicapping; choosing what music to listen to during the task can be very different from the inadequate effort spent on the task from a cognitive perspective. For example, students need to monitor and control attention at each moment to prepare well for the test. On the other hand, choosing less distracting music just needs a one-time decision making. There is a difference in the duration of exerting executive functioning, which may also predict the tendency to self-handicap. Future studies are needed to examine the differences from the various perspectives as well as the reliability and validity of each measurement.

Mindfulness seemed to influence the way how one relates to one's experience differently from self-compassion. Mindfulness facilitates deidentification with one's fragmental inner experience (Hölzel et al., 2011), whereas self-compassion provides a stable source of positive self-regard (Neff & Vonk, 2009). This may be a reason why only self-compassion was effective in lowering self-handicapping behaviors in Study 2. It is possible self-compassion was more

effective in increasing self-concept stability in this current study. More research is needed to explore the different effect of mindfulness and self-compassion on self-concept instability.

In study 3, I examined the mediating effect of self-worth contingency in the relation between interventions (mindfulness and self-compassion) and self-handicapping behavior. I expected self-worth contingency would mediate the relation between self-compassion intervention and participants' choice of less distracting music. Self-worth contingency, an indicator of the instability of self-concept, did not demonstrate the mediating effect. Also, the self-compassion group in Study 3 did not report choosing more facilitating music compared to the control group in this study. This was at odds with the Study 2 result, where the difference was significant. It is possible that with fewer participants in Study 3, I had lower power to detect the effect of experimental effect and the mediation effect.

By re-analyzing data from Study 2, state self-compassion mediated the relation between interventions (mindfulness and self-compassion) and self-handicapping behavior. Since self-compassion is a way to stabilize self-concept, it is reasonable to expect indicators of a more stable self-concept would also mediate the same relation. Further research with more sensitive measurements and large sample size is needed to examine the mediating effect of a more stable self-concept.

Another limitation of the research is the limited sample. This research was done in a predominantly White, Midwestern university, so the result may not generalize to students in other types of institutions. More research should be done on other groups of students to examine the effects. For example, these effects may vary across cultures. To be specific, the need for positive self-regard is rooted in North American culture but not in Japanese culture, whose character is self-critical instead (Heine, Lehman, Markus & Kitayama, 1999). Thus, we can

assume that the need to defend one's positive self-concept may not be universal, or at least it should vary across cultures. To be specific, Japanese people may have lower need to defend a positive self-concept than Americans and may demonstrate self-handicapping behaviors at a lower level.

Conclusion

College students' explicit academic self-concept depended on the feedback of academic tasks in the current research. Thus, the feedback of an academic task could lead to changes in college students' academic self-concept. This instability may be mitigated by self-compassion, as a self-compassion contemplation reduced students' self-handicapping behavior in task preparation. It is unclear if this effect may be mediated by self-worth contingency or not. Even though mindfulness didn't show evidence in reducing self-concept instability or decreasing self-handicapping behaviors, it was effective to help students maintain a competent academic concept after receiving academic feedback. On the whole, however, these results were weaker than anticipated. It is likely that unstable academic self-concept and self-handicapping behaviors are sufficiently trait-like that more than a single-time intervention would be needed to make a practically significant improvement for students. Future research should examine the effects of longer-term self-compassion and mindfulness interventions.

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APPENDIX A. STUDY INTERVENTION TRANSCRIPTS**Appendix A1: Mindfulness meditation audio recording transcript in Study 1**

Sitting in a way that's neither too tight nor too relaxed

But comfortable and upright

Then notice your body from the inside

Noticing the shape and the weight and the touch

And areas you make contact with the floor or the chair

Then you can focus on your breathing

Feeling your breath

In the area of either the abdomen, chest, or nostrils

Feeling the gentle rising and falling of your abdomen or chest

Or the coolness and in and out sensations at your nostrils

So the breath is our anchor

It's where we establish our awareness

It helps us have something to always return to

This simple act of breathing

Now you might notice that other things pull your attention away from the breath

And that might be sound

So right now, just for a moment

Bring your attention to the sounds

Inside the room

Or outside the room

Simply listening

They might be pleasant sounds, unpleasant sounds

Listen to them with curiosity and interest

Noticing them coming and going

Without getting caught up in a story about what that sound is or why it's there

Simply listening

Can also notice the sound of silence

And now letting go of this hearing

The listening

Bring your attention into your body

And notice if there are body sensations

To be aware of

There might be pressure or tightness

Or movement or vibration

Or heat or cold

Or tingling

Notice which sensations call out to you

And let your attention go to them

It might be a very strong and obvious sensation

There might be a soft or subtle sensation

You might notice yourself jumping from sensation to sensation

Or there may be one that grabs your attention and holds it

Particularly if it's unpleasant

You might notice it

Is it growing or shrinking?

Moving

Does it pulse or throb

Ache

Just notice with curiosity

Similarly not making up a whole story about the experience

Just being directly with the sensations in your body

So now return to your breathing

Finding your breath

And as you continue on in this meditation

You'll stay with your breath one breath at a time

If you notice yourself lost in thoughts you can say "thinking"

Or "wandering"

And then redirect your attention

Returning back to the breathing

Now if you find a sound

Or a body sensation

Become so obvious, strong

That you can't, any longer, stay with the breath

Because it pulls your attention away

Then let yourself let go of the breath

And focus on the body sensation

Or sound

Listen to it or feel it

Until it no longer holds your attention

Or it's stopped

At that point go back to the breathing

Returning to the simplicity of your anchor

The breath

We'll try this for a few minutes in silence

[silence]

Now once again notice your whole body sitting here

Tuning into the shape

The posture

The movement

Let yourself relax

And you can wish yourself well

May I be happy and at ease

May I be free from stress and anxiety

May I be peaceful

And let yourself consider the possibility

Of finding peace and ease

Wellbeing

[bell ring]

Appendix A2: progressive muscle relaxation audio recording transcript in Study 1

So sit as comfortable as possible and take several slow breathes in and out

Now if you feel comfortable doing so

Most people get more benefit if they close their eyes

Just continue to slowly and deeply breath in and out

We are going to start with our arms and hands

So tensing up folding your arms, hands

Tensing up your biceps, your triceps, and your hands

Feeling that tension in your arms and hands

Tense Tense Tense

And then relax

Breath in and out. And let the muscles in your arms and in your hands relax

Teach your muscles the difference between tension and relaxation

One more time

Tensing up your biceps, your forearms, your hands

Feeling that tension

Tense Tense Tense

And relax

Breath in and out

And relaxation spread through your arms and to your hands

Breath in and out

Let those muscles relax

Now we are going to tense up our neck and shoulders

So bring your shoulders up to your ears

Feeling that tension in your neck and your shoulders

Tense Tense Tense

And relax

Breath in and out

And let the muscles in your neck and shoulders relax

Take a few deep breathes and let the relaxation spread into your neck and shoulders

One more time

Bring your shoulders up to your ears

Tensing up your neck and shoulders

Tense Tense Tense

And relax

Breath in and out

And let your neck and shoulders relax

Let relaxation spread through your neck and your shoulders

Now you are going to tensing up the muscles in your face

Tensing up your eyes, your jaw, your mouth

Feeling that tension in your face

Tense Tense Tense

And relax

Breath in and out

And let your face relax

Breath in and out

And let your forehead and your jaw relax

One more time tensing up the muscles in your face, your eyes, your jaw, your mouth

Tense Tense Tense

And relax

Breath in and out

And let the muscles in your face relax

Let relaxation spread

Now this time we are going to do our arms in a different way

Reaching out, spreading your fingers wide

Feeling that tension in your upper back and your fingers and your arms again

Tense Tense Tense

And relax

Breath in and out

Letting those muscles relax

Letting relaxation spread through your hands and arms and your upper back

Reaching out again

Tensing up your arms and your upper back and your hands

Tense Tense Tense

And relax

Breath in and out

Tell your arms, your shoulders, and your hands to relax

Now we are going to do our stomach and our lower back

Bringing your belly button to your spine

Tensing up your stomach and your lower back

Feeling that tension

Tense Tense Tense

And relax

Breath in and out

And let your stomach and your lower back relax

Let the relaxation spread to your stomach and to your lower back

One more time

Belly button to spine

Tensing up your stomach your lower back

Feeling that tension

Tense Tense Tense

And relax

Breath in and out

And let relaxation spread through your lower back and your stomach

Continue to breath in and out

Letting the muscles become more relaxed with each breathe out

We are going to do our legs calfs and feet

So raising your heels and pushing your legs together

Creating tension in your calfs, your feet, and your legs

Feeling that tension all the way down your lower body

Tensing these muscles through out

Tense Tense Tense

And relax

And go with that tension

Breath in and out

And let those muscles in your legs relax

Let your calfs and your feet relax

One more time

Tensing up your hips, your legs, your knees, your calfs, your feet, your ankles

Tense Tense Tense

And relax

Breath in and out

And let those legs relax

Breath in and out and let the relaxation spread through your leg muscles

Continue to slowly and deeply breath in and out

Continue to breath in and out

We are going to check for any residual tension

And tell those muscles to relax

Continue to deeply and slowly breath in and out

And through your forehead, become more and more relaxed

As you breath in and out

Let your jaw become more and more relaxed

Continue to deeply and slowly breath in and out

Feeling your neck become more and more relaxed

Let your neck muscles become loose and relaxed

Continue to deeply and slowly breath in and out

Letting your shoulders become more and more relaxed

Now let relaxation spread through your arms
 Becoming more and more relaxed with each breathe
 And feel the back muscles become more and more relaxed
 Letting relaxation spread through out your back
 Continue to deeply and slowly breath in and out
 Noticing your leg muscles becoming more and more relaxed
 Letting go the tension with each breathe out
 And letting your calf muscles become more and more relaxed
 And letting your feet become more and more relaxed
 Take another really deep breathe in
 And as your breath out, let all the muscles in your body become more and more relaxed
 Seeking down, becoming more and more relaxed
 And a deep breathe in
 As your breath out, letting go any tension
 And becoming more and more relaxed
 Now go ahead and bring your focus of attention back to the room

Appendix A3: RAT Task

This task is designed to assess participants' vocabulary ability. It presents three cue words that are associated with a fourth word, which is the correct answer. Please type your answer in the space provided.

Example cues: cottage / swiss / cake

Example answer: cheese

If you don't know the answer, please write down "I don't know" in the space provided.

RAT Difficult items:

D1 stick / maker / point

D2 dust / cereal / fish

D3 right / cat / carbon

D4 cross / rain / tie

D5 chamber / mask / natural

D6 office / mail / hat

D7 age / mile / sand

D8 catcher / food / hot

D9 tank / hill / secret

D10 health / taker / less

D11 lift / card / mask

D12 force / line / mail

RAT Easy items:

S1 cream / skate / water

S2 loser / throat / spot

S3 show / life / row

S4 night / wrist / stop

S5 duck / fold / dollar

S6 rocking / wheel / high

S7 dew / comb / bee

S8 fountain / baking / pop

S9 preserve / ranger / tropical

S10 cracker / fly / fighter

S11 cane / daddy / plum

S12 political / surprise / line

RAT Feedback:

Feedback Thank you for completing the word association task. Your score is (participants' real score was shown). The average student at our university scores 6 of 12 questions correctly, and the average college student nationwide scores 5.3 of 12 questions correctly.

Appendix A4: Mindfulness meditation audio recording transcript in Study 2

We're going to practice the breath meditation.

People sometimes think meditation is some special, magical thing.

It's actually a technique that has been used thousands of years by people of all different faiths and all different cultures and it's a way of getting in touch of what's real.

And so we're going to start with just a basic breath meditation and to begin this it helps to sit in a way that's comfortable.

It's upright without being uptight, that if you're sitting in a chair, you're kind of holding yourself up, your feet are flat on the floor.

So, it's not really formal, but neither is it really slouching and overly relaxed.

If you are sitting in a cushion, the same idea applies.

Once we're sitting here now the idea is just to focusing on what you're feeling, what your actual experience is.

Notice your body, notice how it moves as you breath.

Where do you feel your breath?

Some people notice it at the nostrils, some people in the back of the throat, some people in the chest, some people in the belly.

It doesn't really matter where it is, what matters is that you are noticing what you're actually experiencing.

It could be the coolness and the warmth of it as you're breathing in and out.

It could be the expansion and the contraction.

And the breath is an interesting thing, because it's one of the few things that both can be under voluntary control and under involuntary control.

And so you don't really need to do anything, you don't need to try to force it to happen, because it can happen just on its own. (Slight pause in speaking).

Now one of the other reasons it's useful to pay attention to the breath is because it's actually pretty boring.

So much of our time is usually spent paying attention to things that are distracting, or exciting, or trying to get our attention.

It's useful to come back to having the attentional control all on our own, where we're the ones directing it. (Slight pause in speaking).

So now with yourself, in a posture that you feel you can keep for about ten minutes, start noticing the sensation of breathing. (Pause in speaking).

There might be other sensations that come up too you might notice pressure or tightness someplace in your body, or vibration, or heat, or cold.

Notice which sensations call out to you and it's okay to let your attention go to them, especially if it's a particularly strong and obvious sensation.

It might be telling you, “You need to move,” in which case it’s okay to move, you’re not trying to do damage to yourself.

Adjust yourself as you need to but do it mindfully.

Don’t just do it reflexively.

Notice your body saying, “I have an itch,” or “I want to move,” and see what that feels like for a while before you scratch and move. (Pause in speaking).

And as you notice these sensations, you can notice how they when you place your attention on them.

And then keep coming back to the breath, the breath is always there as an anchor. (Pause in speaking).

If your mind wanders, and it will, that’s its job, you can label it thinking and let it go.

Try not to get caught up in the story about it, don’t worry to much why you started thinking or how you lost your attention.

Just notice that have lost your attention, and smile, and let it go, and come back to the breath. (Pause in speaking).

If it helps to count your breath, that’s fine, you can count up to ten and then start over.

If it helps to label them, “in, out,” “expansion, release,” that’s okay, that helps to keep your mind directed toward the breath.

If something grabs your attention away like a sound or strong feeling, it’s okay to notice it, but don’t cling to it, come back to the breath. (Slight pause in speaking).

This practice helps strengthen our attention.

It helps us to see our habits of mind, how we are constantly seeking something more than what we actually have.

But if you notice how you're feeling right now, it's actually okay, you may not have everything you want at this moment.

But it's enough and the breath is telling you that, "You are enough," right now.

And so I'm going to be quiet for the next few minutes, and just keep directing your attention to your breath and redirecting it when you need to. (Pause in speaking for about four minutes).

Now bring your attention back to the body and notice, is it different then it was just a few minutes ago?

Maybe it feels a little more relaxed, maybe it feels a little more agitated.

It's not good or bad either way, this practice is about noticing what is not how it could be some other way.

And it helps us to start feeling a little more control, not only of our own attention and not so jerked around by environmental stimuli, but also to start noticing that we're okay, (slight pause in speaking), this moment can be okay.

All we need to do is just pay attention to what's really happening, not what's just going on in our heads, that often helps us calmer.

This is of course a practice you can do anytime, on your own.

And the more you do it you'll start noticing different things, you'll get different things out of it.

Thank you.

Appendix A5: Self-compassion meditation audio recording transcript in Study 2

We're going to try a meditation today that's focusing on being okay with ourselves and some of the mistakes we've made.

Now there's no one right way to do meditation, there are lots of different types of meditation.

They all have different goals.

People sometimes think meditation is some special magical thing.

It's actually a technique that has been used for thousands of years by people of all different faiths and all different cultures.

And so today we're going to focus on one that helps us to actually be more okay with ourselves.

So, first make sure you're in a comfortable position.

It's upright without being uptight, that if you're sitting in a chair you're kind of holding yourself up, your feet are flat on the floor.

So, it's not really formal, but neither is it really slouching and overly relaxed.

If you are sitting on a cushion, same idea applies.

And so you want to have a posture where you feel like you're in control of yourself, not too relaxed, not too tense, and something that you could hold for about ten minutes.

So if you need to move please do. If something's really hurting and you need to move, you really should, because this practice isn't about making ourselves suffer or to punish ourselves.

It's actually just about noticing what is and if you need to move then go ahead and do that.

But do it mindfully, just don't do it reflexively and then try to settle into a new posture that you think you can hold for a while.

Now to practice this exercise we actually need to call up some discomfort.

So, I invite you to bring to mind some aspect of your experience, it could be something about your personality, or some mistake you've made, or something that you feel was failure that you had, and some way that perhaps you've been criticizing yourself for feeling like you're not enough or you're inadequate or you really should have known better.

So whatever it is, try to get in touch with that feeling and in this type of meditation it's useful sometimes to tell yourself a story, tell the story of why you feel like this, or why you made this mistake, or what you dislike about the way this situation happened. (Pause in speaking).

So once you've got an example of something that you're unhappy about with yourself, notice what does it make you feel, where do you feel it in your body?

If it helps to label the feeling as sad, or scared, or isolated, inadequate, or whatever it is that's okay you can use these terms.

But if it helps just if you notice that you're feeling it in your heart like an ache or your stomach like your feeling all jittery, that's okay too.

So as you think about this thing, notice where you feel it in your body, notice how it changes the way you think with your mind too, because one idea sometimes brings up other ideas.

And so try and bring this situation fully into your mind's eye, envision it in as much detail as you can and allowing the ache of it to come out in your body however that is for you.

Now with it in your mind, I invite you to perhaps one or both of your hands on your heart and notice the warmth of your hand, notice the warmth of your body.

And what we're going to do now is repeat some phrases and these phrases are designed to help you feel compassion for the fact that people aren't everything they wish they were and that we do make mistakes.

And you certainly try your best, but no one on this planet is perfect, and we all mistakes, and that's the human experience, and that's okay.

It's actually okay to make all these mistakes.

So I'll say a few of these phrases and you can repeat them silently.

Now traditionally these phrases are, "May I be safe," "May I be peaceful," "May I be kind to myself," "May I accept myself as I am."

Now it's useful to connect these phrases to your breath and as you're breathing in or as you're breathing out, it doesn't matter which, you pick the one that works for you, say them to yourself.

And if your hand is at your heart or somewhere else, you can notice the warmth of it and allow that warmth to flow out and permeate you.

May I be safe. May I be peaceful. May I be kind to myself. May I accept myself as I am.

Now these phrases may feel somewhat artificial, but notice these are the types of feelings you would have for a good friend who's had a hard time, these are what you would want for that friend.

You would want them to feel safe, and peaceful, and kindness, and acceptance, and you can give these to yourself.

So repeat these phrases silently to yourself for the next few minutes, really trying to get in touch with the intention behind them, of offering yourself kindness, compassion, and acceptance, the same way you would do for a wonderful friend.

Feeling your breath and saying these phrases, or whatever other phrases might work for you.

Some people have different ways of saying these and that's okay, use the ones that fit you best.

And I'm going to be quiet for a few minutes while you say these phrases, "May I be safe," "May I have peace," "May I be kind to myself," "May I accept myself as I am." (Pause in speaking for about three minutes).

So doing this type of self-compassion and you can do it anywhere, you can do it anytime, can actually help us to become more okay with ourselves, less self-critical, less harsh, more resilient in the face of the mistakes we're inevitably going to make, and more willing to try things.

Perhaps to take a risk, because we know it's okay if we fail.

So letting go of the contemplation, come back to your breath, come back to your body, notice how it feels right now.

Maybe it's different than it was a few minutes ago, maybe you're a little more relaxed or a little more agitated, that's okay.

It doesn't have to be one or the other, we're just trying to notice what is, because allowing yourself to be who you are in this moment really is enough.

Thank you.

APPENDIX B. MEASURES

Appendix B1: Five Facet Mindfulness Questionnaire

Five Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1 2 3 4 5

Never or very rarely sometimes often very often or
rarely true true true true always true

1 When I'm walking, I deliberately notice the sensations of my body moving.

2 I'm good at finding words to describe my feelings.

3 I criticize myself for having irrational or inappropriate emotions.

4 I perceive my feelings and emotions without having to react to them.

5 When I do things, my mind wanders off and I'm easily distracted.

6 When I take a shower or bath, I stay alert to the sensations of water on my body.

7 I can easily put my beliefs, opinions, and expectations into words.

8 I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

9 I watch my feelings without getting lost in them.

10 I tell myself I shouldn't be feeling the way I'm feeling.

11 I notice how foods and drinks affect my thoughts, bodily sensations, and emotions

12 It's hard for me to find the words to describe what I'm thinking.

13 I am easily distracted.

14 I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

15 I pay attention to sensations, such as the wind in my hair or sun on my face.

16 I have trouble thinking of the right words to express how I feel about things

17 I make judgments about whether my thoughts are good or bad.

18 I find it difficult to stay focused on what's happening in the present.

19 When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

20 I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

21 In difficult situations, I can pause without immediately reacting.

22 When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

23 It seems I am "running on automatic" without much awareness of what I'm doing.

24 When I have distressing thoughts or images, I feel calm soon after.

25 I tell myself that I shouldn't be thinking the way I'm thinking.

26 I notice the smells and aromas of things.

27 Even when I'm feeling terribly upset, I can find a way to put it into words.

28 I rush through activities without being really attentive to them.

29 When I have distressing thoughts or images I am able just to notice them without reacting.

30 I think some of my emotions are bad or inappropriate and I shouldn't feel them.

31 I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

32 My natural tendency is to put my experiences into words.

33 When I have distressing thoughts or images, I just notice them and let them go.

34 I do jobs or tasks automatically without being aware of what I'm doing.

35 When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

36 I pay attention to how my emotions affect my thoughts and behavior.

37 I can usually describe how I feel at the moment in considerable detail.

38 I find myself doing things without paying attention.

39 I disapprove of myself when I have irrational ideas.

Appendix B2: BIS/BAS Scales

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

1 = very true for me

2 = somewhat true for me

3 = somewhat false for me

4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.

8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.
11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.
21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

Appendix B3: Toronto Mindfulness Scale

Please read each statement and indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?

Not at all =0

A little=1

Moderately=2

Quite a bit=3

Very much=4

- 1 I experienced myself as separate from my changing thoughts and feelings.
- 2 I was more concerned with being open to my experiences than controlling or changing them.
- 3 I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations.
- 4 I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things 'really' are.
- 5 I was curious to see what my mind was up to from moment to moment.
- 6 I was curious about each of the thoughts and feelings that I was having.
- 7 I was receptive to observing unpleasant thoughts and feelings without interfering with them.
- 8 I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.
- 9 I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.
- 10 I remained curious about the nature of each experience as it arose.
- 11 I was aware of my thoughts and feelings without overidentifying with them.
- 12 I was curious about my reactions to things
- 13 I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.

Appendix B4: State Self-Compassion Scale

Right now...

I'm trying to be kind and reassuring to myself. (SK)

I'm being understanding towards myself. (SK)

I'm trying to take a supportive attitude towards myself. (SK)

It's okay to make mistakes. (SK)

I'm being hard on myself. (SJ)

I'm being intolerant towards those aspects of my personality that I don't like. (SJ).

I feel stupid. (SJ).

A lot of people have negative experiences, I'm not the only one. (CH)

Everyone makes mistakes sometimes. (CH)

Everyone feels bad about themselves sometimes. (CH)

I feel like other people have it easier than me. (IS)

These types of things seem to happen to me more than to other people. (IS)

In the scheme of things, this is not that big of a deal. (MI)

I'm taking a balanced perspective on the situation. (MI)

I keep thinking about what happened. (OI)

I feel consumed by feelings of inadequacy (OI).

Note: SK = self-kindness, SJ = self-judgment, MI = mindfulness, OI = overidentification,

CH = common humanity, and IS = isolation.

Appendix B5: Music Choice

MC Please choose a type of music to listen during the test.

- 1 very distracting
- 2 moderately distracting
- 3 a little distracting
- 4 neither distracting nor facilitating
- 5 a little facilitating

6 moderately facilitating

7 very facilitating

Appendix B6: Examples of Three-Digit Multiplication Questions

$460 \times 403 = ?$

$448 \times 478 = ?$

$542 \times 954 = ?$

$654 \times 746 = ?$

$735 \times 416 = ?$

$308 \times 777 = ?$

$766 \times 438 = ?$

$439 \times 944 = ?$

$965 \times 774 = ?$

$788 \times 286 = ?$

$979 \times 314 = ?$

$751 \times 711 = ?$

$917 \times 266 = ?$

$715 \times 708 = ?$

$936 \times 384 = ?$

$881 \times 938 = ?$

$301 \times 360 = ?$

$185 \times 735 = ?$

$480 \times 592 = ?$

$515 \times 247 = ?$

$792 \times 753 = ?$

$482 \times 305 = ?$

$710 \times 123 = ?$

$284 \times 935 = ?$

$194 \times 699 = ?$

$764 \times 191 = ?$

$274 \times 819 = ?$

$479 \times 272 = ?$

$912 \times 119 = ?$

$702 \times 858 = ?$

$951 \times 933 = ?$

$976 \times 878 = ?$

$293 \times 999 = ?$

$510 \times 257 = ?$

$420 \times 426 = ?$

$333 \times 390 = ?$

$990 \times 856 = ?$

$243 \times 426 = ?$

$645 \times 835 = ?$

$954 \times 759 = ?$

$240 \times 783 = ?$

$420 \times 893 = ?$

$125 \times 603 = ?$

$718 \times 342 = ?$

$$548 \times 785 = ?$$

$$391 \times 688 = ?$$

$$420 \times 174 = ?$$

$$915 \times 361 = ?$$

$$972 \times 559 = ?$$

$$697 \times 463 = ?$$

$$462 \times 659 = ?$$

$$946 \times 301 = ?$$

$$430 \times 192 = ?$$

$$786 \times 963 = ?$$

$$347 \times 648 = ?$$

$$947 \times 347 = ?$$

$$477 \times 862 = ?$$

Appendix B7: Academic Self-handicapping Scale

1= not at all true

3= somewhat true

5= very true

1. Some students put off doing their work until the last moment so they can say that is the reason they didn't do as well as they had hoped. How true is this for you right now?

2. Some students purposely don't try hard in school so that if they don't do well, they can say it's because they didn't try. How true is this for you right now?

3. Some students tend to make excuses when they don't do as well on schoolwork as they should ("I wasn't feeling well, I had to take care of my sister, etc."). How true is this for you right now?

4. Some students blame others when they don't do well in school as they should ("My friends kept me from studying, My teachers didn't explain it to us, etc."). How true is this for you right now?

5. Some students who get a low grade tell their friends they didn't study hard. How true is this for you right now?

Appendix B8: Desire to escape questionnaire

Participants responded on 15-point scales (0: not at all, 7: neutral, 14: extremely) to how much they would "right now, in this moment" like to

- (1) go to sleep,
- (2) leave the study,
- (3) smoke a cigarette,
- (4) drink alcohol.

Appendix B9: Demographic Questionnaire

1. Are you: Male Female
2. What is your age?(in years)_____
3. How would you classify yourself?
 - African American Latino/Hispanic Native American
 - Asian/Pacific Islander Multi-Racial White Other(specify:_____)
4. What is the highest level of education your mother (or stepmother) finished?
 - Some high school Some college Graduate or professional school

High school College Don't know

5. What is the highest level of education your father (or stepfather) finished?

Some high school Some college Graduate or professional school

High school College Don't know

6. What is your parent's current combined annual income?

\$19,999 or less \$20,000-\$39,999 \$40,000-\$59,999 \$60,000-\$99,999

\$100,000-\$149,999 \$150,000-\$199,999 \$200,000 or more Don't know

7. Is English your native language? Yes No

8. Do you have any meditation experience? Yes(go to the next 4 questions) No (end of

survey)

9. How long have you been practicing meditation?(in years, e.g. 3 months =

0.25year)____year(s).

10. How often do you practice? A. Everyday B.3-5 days a week C.1-2 days a week D. Less

than once a week

11. How long are your sessions on average (in minutes)? _____

12. Please specify the kinds of meditation you practice (e.g. Mindfulness, loving-kindness

meditation, reflective prayer, etc.):_____

13. What is your SAT score for Evidence-Based Reading and Writing section?

14. What is your SAT score for Math section? _____

15. What is your high school GPA using 4.0 scale? _____

Appendix B10: Self-worth Contingency Scale

Please respond to each of the following statements by circling your answer using the scale from "1 = Strongly disagree" to "7 = Strongly agree." Please answer how you are feeling about the coming mathematics task in the experiment.

Strongly disagree (1)

Disagree (2)

Somewhat disagree (3)

Neither agree nor disagree (4)

Somewhat agree (5)

Agree (6)

Strongly agree (7)

1. My opinion about myself may be influenced by how well I do in this academic task.
2. Doing well in this academic task should give me a sense of self-respect.
3. I feel better about myself if I do well in this academic task.
4. My self-esteem may be influenced by my performance on this task.
5. I feel bad about myself if I don't perform well in this academic task.

APPENDIX C. IRB APPROVAL LETTERS

Appendix C1: IRB Approval Letter for Study 1

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1136 Pearson Hall
Ames, Iowa 50011-2007
515-294-4388
FAX 515-294-4897

Date: 5/31/2016

To: Lanmiao He
Lago W283

CC: Dr. Dawn M Sweet
366 Carver Hall

From: Office for Responsible Research

Title: Academic skills, habits, and emotions

IRB ID: 16-177

Approval Date: 5/27/2016

Date for Continuing Review: 5/26/2018

Submission Type: New

Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1136 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

Appendix C2: IRB Approval Letter for Study 2

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 08/13/2018

To: Lanmiao He Douglas A Gentile

From: Office for Responsible Research

Title: Audios and Academic Performances

IRB ID: 18-282

Submission Type: Initial Submission **Review Type:** Expedited

Approval Date: 08/13/2018 **Date for Continuing Review:** 08/12/2020

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 36), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- [Retain signed informed consent documents](#) for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study.
- Inform the IRB if the Principal Investigator and/or Supervising Investigator end their role or involvement with the project with sufficient time to allow an alternate PI/Supervising Investigator to assume oversight responsibility. Projects must have an [eligible PI](#) to remain open.
- Immediately inform the IRB of (1) all serious and/or unexpected [adverse experiences](#) involving risks to subjects or others; and (2) any other [unanticipated problems](#) involving risks to subjects or others.
- Stop all human subjects research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Human subjects research activity can resume once IRB approval is re-established.
- Submit an application for Continuing Review at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

IRB 032018

- Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.
- Please be advised that your research study may be subject to [post-approval monitoring](#) by Iowa State University's Office for Responsible Research. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.
- Upon completion of the project, transfer of IRB oversight to another IRB, or departure of the PI and/or Supervising Investigator, please initiate a Project Closure to officially close the project. For information on instances when a study may be closed, please refer to the [IRB Study Closure Policy](#).

Please don't hesitate to contact us if you have questions or concerns at 313-294-4366 or IRB@iastate.edu.

Appendix C3: IRB Approval Letter for Study 3

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 01/16/2019
To: Lanmiao He Douglas A Gentile
From: Office for Responsible Research
Title: Audios and Academic Performances
IRB ID: 18-282
Submission Type: Modification **Review Type:** Expedited
Approval Date: 01/16/2019 **Date for Continuing Review:** 08/12/2020

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 36), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- [Retain signed informed consent documents](#) for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study.
- Inform the IRB if the Principal Investigator and/or Supervising Investigator end their role or involvement with the project with sufficient time to allow an alternate PI/Supervising Investigator to assume oversight responsibility. Projects must have an [eligible PI](#) to remain open.
- Immediately inform the IRB of (1) all serious and/or unexpected [adverse experiences](#) involving risks to subjects or others; and (2) any other [unanticipated problems](#) involving risks to subjects or others.
- Stop all human subjects research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Human subjects research activity can resume once IRB approval is re-established.
- Submit an application for Continuing Review at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

IRB 03/2018

- Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.
- Please be advised that your research study may be subject to [post-approval monitoring](#) by Iowa State University's Office for Responsible Research. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.
- Upon completion of the project, transfer of IRB oversight to another IRB, or departure of the PI and/or Supervising Investigator, please initiate a Project Closure to officially close the project. For information on instances when a study may be closed, please refer to the [IRB Study Closure Policy](#).

Please don't hesitate to contact us if you have questions or concerns at 515-294-4366 or IRB@iastate.edu.