I KNOW WHO I AM: A TRUE SELF-KNOWLEDGE INTERVENTION TO

IMPROVE COLLEGE STUDENTS' ANXIETY,

DEPRESSIVE SYMPTOMS,

AND ALCOHOL USE

by

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DEDICATION

This thesis is dedicated to my parents. They always told me I could do anything I set my mind to, and believed I could even when I didn't. Thank you for your unwavering support.

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ABSTRACT

The transition into college is fraught with the potential for anxiety, depression and risky health behaviors. The goal of my thesis was to design and test an intervention focused on perceived true self-knowledge, or the feeling of knowing who one really is. I hypothesized that increasing perceived true self-knowledge would decrease depression, anxiety, and risky alcohol use. Undergraduate students (N= 91) first completed an online survey that included baseline measurements of anxiety, depression and alcohol use. The day after completing this baseline survey, participants were randomly assigned to complete conditions of the intervention. The intervention phase consisted of four days of writing tasks. Participants in the true self-knowledge intervention condition identified characteristics that define who they truly are daily for four consecutive days. Participants in the control condition did the same thing but were asked to identify office supplies. Two-weeks following the intervention, participants (N=61) completed a second survey that assessed anxiety, depression, and alcohol use. I hypothesized that, controlling for baseline, participants in the true self-knowledge condition would report lower levels of anxiety, depression, and alcohol use compared to the control condition. The results indicated that the intervention did not successfully increase perceived true self-knowledge. Additionally, the results did not support my hypothesis. The only significant effect to emerge was an unexpected increase in the self-reported number of drinks consumed in a typical drinking event among those in the true self-knowledge intervention condition. The limitations of the intervention and potential avenues for future research are discussed.

INTRODUCTION

It seems uncontroversial to conclude that the health (both mental and physical) and the health risk behaviors of college-aged adults is an important issue. The purpose of my research project was to develop and test an intervention aimed at improving student health by increasing students' perceived awareness and knowledge of who they truly are, deep down (i.e., their true self-concept). The true self-concept reflects the characteristics that describe who a person *believes* she/he truly is, regardless of whether or not those characteristics are actually expressed outwardly (Bargh, McKenna, & Fitzsimons, 2002). Although research focused on the true self-concept has revealed that it is a critical contributor to psychological well-being (Schlegel & Hicks, 2011), no interventions specifically targeting the true self-concept have been developed or evaluated. My thesis project is an initial attempt to address this gap. In what follows, I will first review selective research on the mental and physical health of college students. I will then discuss self-affirmation theory and the use of self-affirmation interventions to improve college student health. I will then provide a review of research on the true self-concept and the importance that the feeling of knowing who one truly is has for psychological health. Finally, I will provide an argument for why interventions targeting perceived true self-knowledge could be especially effective and will report an initial study to test such an intervention with college-aged adults.

<u>Mental and Physical Health in College Aged Adults</u>

The transition into college is fraught with the potential for stress, anxiety, and risky health behaviors. My thesis project focused on anxiety, depression, and dangerous alcohol use. These are particularly problematic issues facing college students.

<u>Anxiety</u>

Anxiety generally refers to feelings of tension and apprehension, and is associated with heightened autonomic nervous system activity (Spielberger, Gorsuch, & Lushene, 1970). A large number of college students experience significant anxiety in their daily lives. In a sample of over 79,000 students at various universities across the United States, 54.7% of students reported feeling overwhelming anxiety within the last year (American College Health Association, 2015). A survey completed by 499 counseling centers across the world found that, on average, 47.42% of all college students who visit counseling centers struggle with anxiety (Association for University and College Counseling Center Directors, 2014). According to the Anxiety and Depression Association of America (2014), only 18% of adults report anxiety disorders. This evidence suggests that college students are exhibiting a substantially larger prevalence of anxiety related concerns compared to the national average of individuals reporting actual anxiety disorders.

<u>Depression</u>

Depression is typically characterized by persistent feelings of sadness and loss of interest in previously enjoyed activities. Depression is an issue on college campuses and has a range of negative consequences. For example, a national (U.S.) study of over

70,000 students found that 33.2% of students felt "so depressed that it was difficult to function" within the last year (American College Health Association, 2015). A meta-analysis of 24 published studies on depression in college students showed that college students experience greater rates of depression than the general population (Ibrahim, Kelly, Adams, & Glazebrook, 2013). Moreover, depression has real consequences for student success. A study of 330 university students in the United States found that students diagnosed with depression had an average 0.49 lower grade point average than non-diagnosed students (Hysenbegasi, Hass, & Rowland, 2005). This information suggests that depression is a problem among college students that negatively impacts, among other things, their potential for academic success.

Dangerous Alcohol Use

Dangerous alcohol use, or binge drinking, is defined by the National Institute on Alcohol Abuse and Alcoholism as the consumption of 5 or more alcoholic drinks within a couple of hours for men, and 4 or more alcoholic drinks within a couple of hours for women. According to the Center for Disease Control (CDC, 2014), binge drinking can lead to myrfiad health complications, including liver disease, alcohol poisoning, and neurological damage. Additionally, binge drinkers are 14 times more likely to report alcohol impaired driving than non-binge drinkers (Naimi, Brewer, Mokdad, Clark, Serdula, & Marks, 2003). Dangerous alcohol use is an important issue facing college campuses. In a sample of over 79,000 students at various universities across the United States, 36% of students reported dangerous alcohol use patterns at least once within the last two weeks (American College Health Association, 2015). A study of 869 first year

college students revealed that 22% of male and 19.1% of female participants reported drinking 5 or more drinks in a single occasion at least once in the past two weeks (Geisner, Mallett, & Kilmer, 2012). A National Epidemiological Survey of 43,093 participants indicated that risk for alcohol use disorders is significantly greater in college attending students than non-college attending students. The study also found that college attending students were less likely to seek treatment for alcohol use problems than non-college students (Blanco et al, 2008). Taken together, these statistics indicate that many college students report dangerous alcohol use, placing them and their community at risk.

Drinking Motivations

In addition to dangerous alcohol use, a consideration of the reasons why people drink can also inform drinking problems in college students. According to Cooper (1994), there are four core motivations for drinking. Drinking to enhance refers to an internally generated positive reinforcement, such as drinking to enhance positive mood or well being. Drinking for social enhancement refers to an external motivation to obtain positive social reinforcement. Drinking to conform refers to an external motivation to drink to avoid social censure or rejection from others. Finally, drinking to cope refers to an internal motivation to reduce or regulate negative emotions through alcohol consumption. Social and enhancement motives are most strongly associated with actual drinking consumption (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). However, drinking to cope has been consistently linked to heavy alcohol use and alcohol dependence (Cooper, Russell, and George, 1988; Neighbors et al., 2007). Therefore, while social and enhancement motivation strongly predict consumption, the motivation to

drink in order to cope with negative emotions may be most strongly linked to problematic drinking.

Summary

Anxiety, depression, and alcohol use are important health concerns facing many college students. These health concerns have many consequences, including declines in academic achievement and long-term physical health. Given the existence of these issues, the development of interventions that help curtail them is obviously an important endeavor for prevention scientists. My thesis project was grounded in an approach that targets people's self-concept and is informed by social psychological theory.

Self-Affirmation as Intervention

Self-affirmation interventions (Sherman & Cohen, 2006) are especially notable in this context for two reasons. First, these interventions are derived from social psychological theory (described below) and the use of theory in the development of interventions has clear advantages (cf. Michie & Prestwich, 2010). For example, theory can inform interventions by emphasizing key mechanisms that are causally related to behavior and can be best targeted to change behavior. A second reason to focus on self-affirmation interventions is that they have diffuse effects. That is, self-affirmation interventions positively impact a variety of outcomes (e.g., stress, alcohol use) through a common mechanism, which makes them particularly useful when attempting to simultaneously improve multiple distinct outcomes. In what follows, I provide an overview of self-affirmation theory and self-affirmation intervention research, followed

by a discussion of a potentially important caveat that I aimed to address with my thesis project.

Self-Affirmation Theory

Self-Affirmation Theory (Steele, 1988) posits that people are motivated to maintain a global narrative of one's self as moral and adaptive. That is, people are motivated to maintain an "experience of self . . . as competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes, and so on" (Steele, 1988, p. 262). The theory also posits that everyday life is filled with situations that can threaten or undermine these beliefs and that people engage in defensive processes to restore beliefs about the self's global integrity. Consider the following example. An individual who drinks heavily is confronted with information that drinking alcohol is a serious health risk. This information threatens her self-integrity by suggesting that she has a problematic behavior. The health information provided implies that she is not adaptively handling her personal alcohol use or well-being. This information would then be perceived as a threat to the belief that she is a rational and adaptive individual. A common example of a defensive response to this type of threat would be avoidance. When people are faced with information that is an immediate threat to their self-integrity, they are likely to dismiss the threatening information or refute the idea that their behavior is problematic (Cohen et al., 2007). Self-affirmation theory explains this type of response by suggesting that avoidance allows the self to ignore the conflicting information and maintain the individual's self-integrity. The self will manipulate or disregard information

in order to retain an image of the self as moral, good, and adaptive (Greenwald, 1980).

Self-affirmation tasks secure self-integrity and prepare people for potential threats they

might face. Once self integrity is secured, threats no longer seem as severe and can be

approached and reconciled adaptively.

Indeed, guided by this logic, self-affirmation interventions are utilized to

positively affect outcomes ranging from stress responses to disparities in education

performance. These interventions typically require participants to briefly think about or

write about things that affirm the integrity of the self-concept. For example, one

commonly used intervention has people select their most important value, from a list of

values, and write about why it is important to them and a recent time that they

represented that value (Logel & Cohen, 2012). Writing about self-important values

secures self-integrity and reinforces the availability of psychological resources needed to

combat threats. These resources extend beyond any particular threat and thus put the

threat into "perspective," allowing the individual to adaptively respond. Considerable

empirical evidence has supported this logic and has revealed that self-affirmation

interventions effectively mitigate a variety of negative psychological outcomes (Cohen &

Sherman, 2014).

For example, self-affirmation interventions reduce stress. One particular study

focused on the effects of self-affirmations on college students' stress heading into a mid-

term exam (Sherman, Bunyan, & Creswell, 2009). Stress was indexed by epinephrine

levels. Epinephrine is a neurotransmitter involved in the activation of the fight or flight

system. The fight or flight system is known to be triggered by stress (Bellinger, Lorton,

Lubahn & Felten, 2001; Weiner, 1992). In this study, participants first gave urine

samples so that baseline epinephrine levels could be assessed. They were then placed into

a control or self-affirmation condition. Participants in each condition completed two

writing tasks over the course of a week. In the self-affirmation condition, participants

were e-mailed a link to a 10-minute writing task where they wrote about a value they

ranked as most important. Participants in the control condition wrote about their least

important value. For the second writing task, participants in the self-affirmation condition

wrote about their second most important value and participants in the control condition

wrote about their second least important value. Four days following the final writing task,

the day prior to the midterm, participants gave a final urine sample. The results showed

that participants who completed self-affirmations exhibited reduced epinephrine levels on

the day prior to their exam compared to students in the control condition. This effect

occurred primarily among the participants who felt most threatened by the midterm,

supporting the idea that self-affirmations buffer the stress associated with threats to one's

self integrity.

Research also shows that self-affirmation interventions can curtail alcohol use.

Recall the example described earlier. Receiving information about the health

consequences of one's behavior can increase defensiveness and reduce a person's

openness to the information. Self-affirmations should curtail that defensiveness. In one

study (Armitage, Harris & Arden, 2011), participants first reported their average alcohol

intake (baseline) by indicating how many drinks they consumed during a typical week.

Immediately following their alcohol consumption report, participants completed either a

self-affirmation questionnaire, a self-affirmation-implementation intention task, or a control questionnaire. In the self-affirmation questionnaire, participants elaborated on their past kindnesses, which is generally considered a highly important personal value and an example of a values affirmation. In the self-affirmation implementation questionnaire, participants were presented with potentially threatening situations and prompted to select an intended response to the threat from one of four provided self-affirming prompts: "Think about things I value about myself," "remember things that I have succeeded in," "think about what I stand for," or "think about things that are important to me." In the control condition, participants gave their opinions on 10 unrelated issues (e.g., "I think the color blue looks great on most people"). Following the questionnaires, participants received an alcohol use relevant health message. The message was a diagram displaying the areas of the body most affected by alcohol consumption and a list of 39 medical conditions related to alcohol consumption. One-month following this lab visit, participants completed the same alcohol consumption survey completed at baseline. The researchers found that participants who completed a self-affirmation task (values affirmation or self-affirmation implementation intention task) prior to the health message showed reduced drinking behaviors at the one-month follow-up compared to participants who completed the neutral task. Thus, self-affirmations bolstered self-integrity and made people more open to threatening information, which, in turn, allowed for positive health changes in the face of threatening health information.

The above examples indicate that self-affirmations can reduce stress and anxiety in the face of an imposing mid-term exam and reduce self-reported alcohol use following presentation of a potentially threatening health message. Research also indicates that self-affirmations may reduce psychological processes that fuel depression. Specifically, rumination is a central feature of depression (Nolen-Hoeksema, 2000) and self-affirmation reduces ruminative thought (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999). In one study, participants were first induced to experience frustration in order to instigate ruminative thought. To establish frustration, participants were given failure feedback on an impossible intelligence task. Following the failure feedback, one third of the participants affirmed an important self-aspect, one third did not affirm an important self-aspect, and the final third were told that the test was not an actual intelligence test (thus eliminating the psychological impact of the feedback). All participants then completed a task designed to assess rumination by capturing the mental accessibility of thoughts related to the intelligence test. The critical results indicated that participants who self-affirmed showed reduced ruminative thought relative to participants who did not self-affirm. This suggests that self-affirmations can reduce the psychological processes that give rise to depression.

Summary

Self-affirmation theory suggests that people are motivated to maintain a global narrative or belief that they are moral and adaptive. The theory further suggests that people will engage in psychological defenses to maintain these beliefs when the self's global integrity is threatened. Self-affirmation interventions generally involve having

participants reflect or elaborate on a value of particular self-importance. These interventions secure self-integrity and prepare people for potential threats they might face. After self-integrity is secured, threats no longer seem as impactful and can be approached and reconciled adaptively. There is evidence that self-affirmation interventions positively affect stress, ruminative thoughts related to depression, and responses to alcohol messages that curtail alcohol use. There is thus reliable evidence for the effectiveness of self-affirmation interventions. However, emerging research also suggests that not all self-affirmations are equal in consequence (Schimel, Arndt, Banko, & Cook, 2004). The section below describes why focusing on a particular aspect of the self – the true self-concept – might be most beneficial.

<p style="text-align:center">The True Self Concept</p>

The True Self, Authenticity,
<u>and Psychological Security</u>

The true self-concept is defined as the characteristics that reflect who people subjectively believe they truly are, deep down (Bargh et al., 2002). It is "who" people believe they truly are, regardless of whether or not they always express it and is similar to the notion that all things contain an essence that defines their true nature. Guided by early humanistic approaches to psychology (e.g., Rogers, 1959), psychological research has increasingly focused on the ways that the true self-concept contributes to psychological well-being.

Much of this work has stemmed from models of dispositional authenticity (Kernis & Goldman, 2006; Wood, Linley, Maltby, Baliousis, & Joseph, 2008). Kernis and

Goldman (2006) advanced the first psychological definition of authenticity as "the unobstructed operation of one's true- or core-self in one's daily enterprise" (p. 294). It is important to note that authenticity reflects a subjective feeling. It reflects the degree to which people feel that their true selves are operative in daily life, regardless of whether or not those feelings reflect objective reality. Building from this definition, Wood et al. (2008) more recently described authenticity as a personality characteristic comprised of three interrelated facets. True self-alienation is described as the perceived feeling of being detached from or not knowing who one truly is. Authentic living is the behavioral component that refers to the extent to which one feels that one lives in accordance with one's core beliefs or values. Finally, the acceptance of external influences is the degree to which people feel compelled to behave in accordance with other people's expectations or standards (i.e., their behavior does not derive from their core motivations/values).

In general, research focused on authenticity has revealed that individual differences in authenticity relate to central facets of psychological well-being. People who perceive their behavior to be authentic experience greater psychological well-being. For example, they show higher self-esteem, greater life satisfaction, and positive affect. Additionally, there is an inverse relationship between the feeling of authenticity and negative affect, anxiety, and depression (Wood et al, 2008; Goldman & Kernis, 2006; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Interestingly, a study looking at the daily relationship between self-esteem and authenticity revealed that experiencing one's true self on a daily basis was positively related to reported daily self-esteem (Heppner et al., 2008).

In addition, and of relevance to my thesis project, experimental research that induces people to focus on or affirm their true self-concepts has revealed that the true self-concept plays a causal role in a number of important outcomes. For example, Arndt, Schimel, Greenberg, and Pyszczynski (2002) focused on the ways that the true-self might affect conformity. They had participants engage in one of three randomly assigned writing tasks prior to rating several abstract pieces of art. In the true self condition, participants were instructed to write about one quality that reveals who they are as a person and to "describe a time when [they] displayed this personal quality and how it . . . reflects [their] true selves" (p. 677). In the achievement condition, participants wrote about a time when they accomplished something that made them feel good about themselves. In the neutral condition, participants wrote about a recent innocuous task like watching television or filing papers. Following these writing tasks, participants were given a packet of abstract art pieces to rate. Each piece of art was presented on an individual page with the ratings of 23 "other" purported students who ostensibly rated the artwork in previous sessions. These ratings were created by the experimenters so they could assess how writing about the true self affects tendencies to conform one's behavior to be consistent with others. The results of the study showed that participants who wrote about the true self-concept conformed their ratings to those of other students' less than participants who wrote about an achievement and a neutral topic. Such findings indicate that affirming the true self-concept may increase the security of people's self-views, allowing them to more freely deviate from the pressures of social influence.

Similar research indicates that focusing people on the true self-concept can engender adaptive emotional reactions to personal shortcomings (Vess, Schlegel, Hicks, & Arndt, 2014). In one study, participants were separated into one of three writing conditions: a true self-condition, a positive self attribute condition, and a neutral condition. Participants in the true self condition wrote about characteristics that define who they really are. Participants in the positive self attribute condition wrote about a significant accomplishment. Participants in the neutral condition wrote about an ordinary event. Following the writing task, participants were either given positive or negative feedback on a purported test of intelligence. The results revealed that participants in the true self-condition reported greater shame-free guilt, and lower guilt-free shame, than the other two conditions. Shame-free guilt is typically viewed as an adaptive response to failure because it is does not reflect global negative evaluations of the self and is instead thought to prompt reparative actions. Guilt-free shame, on the other hand, is generally considered maladaptive because it reflects an internalization of failure and predicts increased anxiety and depression (Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996; for a review, see Tangney & Tracy, 2012). Thus, Vess et al. (2014) indicates that the true self-concept can promote more emotionally adaptive reactions to personal shortcomings.

It is notable that these experimental studies suggest that focusing people on the true self-concept increases psychological security, much in the same way that self-affirmation interventions are posited to function. In fact, the studies discussed above (Arndt et al., 2002; Vess et al., 2014) found that writing about the true self-concept

reduced conformity and increased adaptive reactions to failure relative to writing about other positive self-affirming experiences (i.e., achievements). This is consistent with the argument that true self-affirmations might be most effective at curtailing psychological insecurity.

Schimel et al. (2004) were the first to propose that affirmations of the true self might be more effective at reducing the negative consequences of threat than affirmations of other positive aspects of the self that require external validation (e.g., achievements). To test this hypothesis, the researchers randomly assigned female participants into one of two different types of self-affirmation tasks. Participants in the true self-affirmation task completed sentence stems about characteristics that described who they really are, whereas participants in the achievement condition completed sentence stems that were focused on achievements and success. Following the self-affirmation task, researchers experimentally induced the feeling of stereotype threat. Stereotype threat is a salient fear of confirming a negative stereotype about a group to which one belongs and identifies with (Steele, 1997). In the threat condition, a math test was characterized as a quantitative exam and women identified their gender prior to beginning the exam. This made salient to the participant that she was a female taking a math exam and therefore activated stereotype threat (Spencer, Steele, & Quinn, 1999). In the non-threat condition, the math test was characterized simply as a problem-solving task. The results showed that, when under stereotype threat, participants in the true self condition performed significantly better on the math task compared to those in the achievement condition. This again suggests that affirmations of the true self-concept mitigate the negative

consequences of threat more effectively than affirmations of other positive aspects of the self.

Perceived True Self-Knowledge. Yet, although research supports the heightened efficacy of true self-affirmations for enhancing security and improving well-being, other research suggests that perceived true self-knowledge may be a critical determinant of whether or not the true self functions in this capacity. Perceived true self-knowledge reflects how well people subjectively feel that they know who they truly are. The construct is featured in Wood et al.'s (2008) model of authenticity (labeled true self-alienation) and is viewed as one of the prerequisites for authentic living. That is, one has to know who one truly is before one can live in ways consistent with who one truly is. Research also indicates that focusing people on the true self-concept can, in some contexts, only affect well-being if people also feel like they know who they truly are.

Specifically, Schlegel and colleagues (2011) conducted an experiment exploring the impact of perceived true self-knowledge on meaning in life. In one study, participants were randomly assigned to generate word lists describing either their true self or their actual self. Participants were given the definitions of the particular type of self to reference for their respective word lists. The true self was described as "the characteristics, roles or attributes that define who you really are—even if those characteristics are different from how you sometimes act in your daily life" (pg.4). The actual self was described as "the characteristics, roles or attributes that define who are in your daily life—even if those characteristics are different than who you really are" (pg. 4). In order to manipulate perceived knowledge, half of the participants in each self-

condition generated 5 self-descriptors (easy) and the other half generated 18 self-descriptors (difficult). This difference in the number of words generated manipulated the experience of metacognitive ease or fluency. Previous research (Schwarz et al., 1991) indicates that the metacognitive experience of *fluency* serves as a cue to what people think they know. Therefore, generating 5 examples of self-characteristics should feel easier and elicit a greater feeling of knowing who one truly is. The results revealed that there was an interaction between self-condition (actual vs. true) and metacognitive-ease. Experiencing metacognitive-ease when generating true self-characteristics increased meaning in life relative to experiencing difficulty. No such effect emerged in the actual self-condition. These findings thus imply that the feeling of knowing who one truly is may be more impactful on well-being than simply writing about one's true self. In other words, one must feel like one knows who one truly is for the true self to function positively.

But why? Returning to the basic premise of self-affirmation theory (Steele, 1988), people are, in part, motivated to maintain a view of one's self as a moral, rational, and adaptive individual. People want to believe that they are "good" and capable of "doing the right thing." Interestingly, research on moral reasoning has revealed that people seem to believe that the true self-concept is inherently morally good. For example, people see morally virtuous (vs. reprehensible) behavior as more indicative of someone's true self (Newman, Freitas, & Knobe, 2013) and people see changes in behavior that are "morally" good (vs. immoral) to be caused by someone's true self (Newman et al., 2015). Thus, these studies suggest that the true self-concept is inherently tethered to feelings of

being a moral person. To the extent that such feelings underlie the goals of self-affirmation interventions, then increasing feelings of perceived true self-knowledge may directly impact one of the psychological mechanisms that make self-affirmation interventions effective. An intervention targeting perceived true self-knowledge may therefore offer a more precise way of affecting positive psychological change.

<div style="text-align:center">Proposed Study</div>

The goal of this project was to develop and test the efficacy of a perceived true self-knowledge intervention on college students' anxiety, depression, and alcohol use. Participants completed a three-wave study in which anxiety, depression, and alcohol use were assessed during a baseline period. The days following the baseline assessment, participants completed a writing task each day for 4 consecutive days. This writing task constituted the perceived true self-knowledge intervention. In the treatment condition, participants completed writing tasks designed to increase perceived true self-knowledge. In the control condition, participants completed a neutral writing task once a day for four days. Finally, two weeks following the end of the writing intervention phase, participants completed the same outcome measures that they completed during the baseline assessment. I hypothesized that, controlling for baseline, participants in the true self-knowledge condition would report lower levels of anxiety, depression, and alcohol use compared to the control condition.

METHODS

Participants

Participants were college undergraduates recruited from the Montana State University Introduction to Psychology Subject Pool. Participants were compensated with participation points that fulfilled a part of the Introduction to Psychology course requirements. Ninety-one participants completed the baseline questionnaire for this study. Twenty-nine participants dropped out between baseline and outcome assessment. Thus, sixty-four participants completed all phases of the study (44 females, 19 males, 1 unknown; Control = 33, Treatment = 31). We did not collect participants' age in an attempt to reduce concerns about reporting underage drinking behaviors.

Critical Materials (all materials provided in Appendix) and Procedure

Phase 1 (Baseline Measures)

The study announcement was presented to all students as an online study research opportunity. Participants signed-up via an on-line system and were provided an external link to a Qualtrics survey. Qualtrics is an on-line survey production website that researchers utilize to conduct Internet research. The initial survey created a separate data file to record participant names for credit assignment, thus protecting participants' anonymity. After providing their name, participants were re-directed to the actual baseline survey.

Anxiety. The State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was utilized as an assessment of state and trait anxiety. This inventory consists of 40 self-report questions that assess state (momentary feelings) and trait (dispositional) anxiety. This measure is valid and shows reliability across varying ages and ethnicities (Donham, Ludenia, Sands & Holzer, 1984; Hishinuma et al., 2001). Example state anxiety items include "I am calm" and "I feel nervous." Example trait anxiety items include "I feel like a failure" and "I feel satisfied with myself." State anxiety items require participants to indicate how they feel right now, at this moment. Trait anxiety items require participants to indicate how they generally feel. Responses to all items are made on 1 (*not at all*) to 4 (*very much so*) scales.

Depression. The Beck depression inventory (Beck et al., 1961) was utilized to gauge self-reported depression. This inventory is a self-report scale of depression severity. It is a well-established assessment used in both clinical settings and non-clinical settings (Ripoll, Olivan-Blazquez, Vicens-Pons, Roca & Gili, 2015; Buttenschon et al., 2015). An example item from the scale is "Sadness". Responses are made on a scale of 0 to 3, with each value tailored to the question (ex. *0- I do not feel sad, 1- I feel sad much of the time, 2- I am sad all the time, 3- I am so sad or unhappy that I can't stand it.*).

Alcohol Use. The National Institute of Alcohol Abuse and Alcoholism Alcohol Consumption Questionnaire was utilized to assess drinking habits. This questionnaire consists of 5 self-report questions regarding alcohol consumption. The questions assessed frequency "In the last 2 weeks, on how many days did you drink?", typical

quantity "During the last 2 weeks, how many standard drinks did you have on a typical day when you drank?", binge drinking episodes

"If you are a female (male), During the last 2 weeks, during a typical month how often did you have 4 (5) or more standard drinks on one occasion or at one sitting?", largest number of drinks in one day, "During the last 2 weeks, what is the largest number of standard drinks that you drank in a 24-hour period?", and the frequency of days the largest number of drinks were consumed "During the last 2 weeks, on how many days did you drink this largest number of drinks?".

Drinking Motives. The Drinking Motives Questionnaire- Revised (Cooper, 1994) is a 20-item index that was used to determine motives for alcohol consumption. There are four main categories of motivation assessed by this scale: Social Enhancement, Enhancement, Conformity and Coping. This measure has been internationally validated and is used frequently in college populations (Kuntsche, Stewart, & Cooper, 2008; Gallen & Rogers, 2004). Example questions from each subscale include: Social- "Because it helps you enjoy a party"; Enhancement-"Because you like the feeling"; Conformity- "Because your friends pressure you to drink"; Coping- "To forget your worries". Participants rate on a 4-point scale 1*(Almost Never)* to 4 *(Almost Always)* how frequently they drink for each of the reasons identified in the scale.

Authenticity. The Wood authenticity scale (Wood et al., 2008) was used to assess three distinct aspects of authenticity: true self-alienation, authentic living, and acceptance of external influence. This measure has been well-established and used in several

domains including work outcomes and aggression (Bosch & Taris, 2014; Pinto, Maltby, Wood, & Days, 2012). Example items from each subscale include: "I feel out of touch with the real me" (true self-alienation), "I am true to myself in most situations" (authentic living), and "I am strongly influenced by the opinions of others" (acceptance of external influence). Responses to each item are made on 1 (*not at all true of me*) to 6 (*very true of me*) scales. Although all three aspects of authenticity are important, the true self-alienation subscale is most relevant to my focus on perceived true self-knowledge.

Phase 2 (Intervention Phase)

Following the baseline collection phase, participants were randomly assigned to either the true self-knowledge intervention condition or the control condition. Starting Tuesday, participants were e-mailed a link to a survey based on condition around 8 am. They were sent an additional e-mail reminding them they had until 11:59pm to complete the survey every evening around 8pm.

True Self-Knowledge Intervention. The day following the baseline assessment phase, participants were randomly assigned to conditions of my true self-knowledge intervention. Participants in both conditions were asked to complete a writing exercise once a day for 4 days (Tuesday-Friday). The writing task varied based on condition.

True Self. Participants assigned to the true self-condition received the following prompt daily.

"Today, we would like you to think specifically about how you would describe your TRUE SELF. Specifically, we'd like you to think about the characteristics, roles or

attributes that define who you really are – even if those characteristics are different than how you sometimes act in your daily life. [For example, think about the following song lyric: "Can you see the real me?"] Imagine this is a song about you—how would you describe the real you?

On the first day of the intervention, participants generated twelve "true self" descriptors. On the second day of the intervention, participants generated eight characteristics. On the third day participants generated six characteristics. On the last day of the intervention, participants generated four characteristics. According to research by Schlegel et al. (2011), the experience of ease when generating these descriptions increases perceived true self-knowledge. Thus, across the intervention phase, the true self-knowledge intervention is designed to increase the feeling of ease when generating true self-descriptions, and to guide individuals to the identification of the specific traits that are indicative of who they truly are.

Control Condition. Participants in the control condition completed a similar task focused on the essential items found in an office. On the first day of the control condition, participants generated a list of twelve essential items one would find in an office. On the second day of the intervention participants generated eight items. On the third day participants generated six items. On the last day of the intervention participants generated four items.

Manipulation Check. On the final day of the intervention phase participants were

presented with the self-alienation subscale of the Wood Authenticity measure to assess

the efficacy of the intervention.

Phase 3 (Outcome Measures)

Two weeks following the intervention phase participants were contacted via email

and informed that a second opportunity to earn a research participation credit. Again,

these were administered via an on-line survey. The follow-up survey consisted of the

same measures administered in the baseline, as well as several exploratory measures.

Information regarding the reliability, means and standard deviation for the above

mentioned measure can be found in Table 1 (refer to page 25). A visual representation of

the timeline can be found in Figure 1 (refer to page 26).

Table 1. Dependent Measures Descriptive Data

	Baseline			Outcome		
Measure	α	*M*	*SD*	α	*M*	*SD*
State Anxiety	.94	40.23	12.64	.95	38.52	13.18
Trait Anxiety	.94	44.13	12.16	.95	42.20	12.64
Beck Depression Inventory	.90	11.90	8.97	.94	11.17	9.93
Coping Motives						
Social Enhancement	.93	10.98	4.70	.94	11.20	4.55
Enhancement	.90	9.80	4.37	.88	9.97	4.08
Conformity	.85	6.32	2.23	.94	6.86	2.76
Coping	.87	8.15	3.75	.89	8.45	3.76
Wood Authenticity Scale						
Authentic Living	.81	21.41	4.99	.89	21.96	5.13
Accepting External Influence	.86	12.29	5.17	.88	11.62	5.06
Self-Alienation	.90	11.60	6.54	.92	10.49	6.30

All scores reported are summed scores

Perceived True Self-Knowledge Intervention Timetable			
	Phase 1: Baseline Assessment	**Phase 2: Intervention**	**Phase 3: Outcome Assessment**
Week 1: Monday	**Baseline Measures:** State and Trait Anxiety Inventory Beck depression inventory NIAAA-Alcohol Use Drinking Motives Questionnaire-Revised Wood authenticity scale		
Week 1: Tuesday-Thursday		Intervention: True self knowledge or neutral	
Week 3: Friday			**2- week Follow-up:** State and Trait Anxiety Inventory Beck depression inventory NIAAA-Alcohol Use Drinking Motives Questionnaire-Revised Wood authenticity scale

Figure 1. Perceived True Self Knowledge Intervention Timeline

RESULTS

Preliminary Analyses

Bivariate Correlations

I computed correlations between all variables of interest at all time points. These results are presented in Tables 2 & 3 (p. 33-34).

Baseline Equivalence

I first conducted several tests to assess whether the treatment and control conditions were equivalent at baseline. I conducted independent samples t-tests on all baseline measurements of the variables of interest using condition as the group identifier (the means by condition are presented in Table 4). As predicted, there was no baseline difference between conditions on state anxiety, $t(88) = -1.11$, $p = .270$, $d = .23$, depression, $t(88) = 0.08$, $p = .935$, $d = -0.02$, self-alienation, $t(88) = -0.06$, p $= .949$, $d = 0.01$, drinking to cope, $t(89) = -1.89$, $p = .24$, $d = 0.09$, drinking to conform, $t(89) = -1.89$, $p = .24$, $d = -0.16$, drinking for social enhancement, $t(89) = 1.48$, $p = .142$, $d = -0.31$, drinking to enhance, $t(89) = 1.01$, $p = .315$, $d = -0.21$, days drinking, $t(88) = 0.78$, $p = .435$, $d = -0.17$, drinks consumed in typical night of drinking, $t(88) = 0.69$, $p = .490$, $d = -0.15$, binge drinking, $t(85) = -0.22$, $p = .825$, $d = 0.05$, most drinks consumed in one sitting, $t(87) = .60$, $p = .552$, $d = -0.13$, or number of days highest number of drinks were consumed, $t(89) = .186$, $p = .853$, $d = 0.17$. Thus, the conditions were equivalent on the measures of interest at baseline.

Dropout Equivalence

Next, because some participants dropped out of the study prior to the outcome

assessment, I conducted tests comparing baseline assessments between participants who

dropped out of the study and those who remained in the study. The results of these

analyses revealed no baseline differences between those who completed the study and

those who dropped out on state anxiety, $t(88) = 0.38$, $p = .709$, $d = -.09$, depression,

$t(88) = 0.25$, $p = .805$, $d = -0.06$, self-alienation, $t(88) = -0.23$, $p = .818$, $d = 0.05$,

drinking to cope, $t(89) = -0.44$, $p = .66$, $d = -.10$, drinking to conform, $t(89) = -0.91$, $p =$

$.37$, $d = -0.20$, drinking for social enhancement, $t(89) = -0.55$, $p = .585$, $d = .12$, drinking

to enhance, $t(89) = -0.49$, $p = .626$, $d = .11$, days drinking, $t(88) = 0.26$, $p = .797$, $d = -$

$.06$, drinks consumed in typical night of drinking, $t(88) = -0.64$, $p = .523$, $d = .15$, binge

drinking, $t(85) = -0.12$, $p = .905$, $d = .03$, most drinks consumed in one sitting, $t(87) = -$

0.10, $p = .923$, $d = .02$, or number of days highest number of drinks were consumed, $t(89)$

$= -1.05$, $p = .297$, $d = .24$.

Manipulation Check

I also conducted a preliminary analysis to test whether the writing intervention

elicited differences in perceived true self-knowledge immediately after the last writing

day. The Wood et al. (2008) measure of true self-alienation was utilized as the dependent

variable of this analysis. However, because true self-alienation was included in the

baseline assessments, I conducted an Analysis of Covariance (ANCOVA) testing for

condition differences on time 2 true self-alienation controlling for baseline true self-

alienation. There was no significant difference between the treatment ($M_{adj} = 9.25$) and

control conditions (M_{adj} = 9.35), $F(1,68)$ = 0.014, p =.908.

However, a mixed ANOVA with intervention condition as a between subjects factor and measurement time (baseline vs. immediately after intervention) as a within-subjects factor revealed that true self-alienation significantly decreased from baseline (M =11.45) to immediately after the intervention (M = 9.30) in both intervention conditions, $F(1,69)$= 17.067, p < .000. This indicates that participants felt like they knew themselves better after the intervention (vs. baseline), regardless of what condition they were in.

Primary Analyses

Although the manipulation check revealed no significant immediate effect of intervention condition on true self-knowledge, I nevertheless conducted analyses to test whether the intervention, relative to control, significantly affected the outcome measures of interest 2 weeks post intervention. Multiple ways of testing these analyses exist. However, previous research (Breukelen, 2006) suggests that ANCOVAs controlling for baseline measures provide the most powerful test of intervention effects when no differences at baseline are present. This was the case with my study. Thus, I utilized ANCOVAs to test for treatment effects on the outcome measures of interest.

Anxiety

To test the effects of the intervention condition on anxiety, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome state anxiety controlling for baseline state anxiety. Those in the true self-knowledge condition (M_{adj} = 38.55) did not differ from those in the control condition (M_{adj} = 38.39), $F(1,61)$=

.00, $p = .953$, $\eta^2_p = .00$.

Depression

To test the effects of the intervention condition on depression, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome depression controlling for baseline depression. Those in the true self-knowledge condition ($M_{adj} = 10.27$) did not differ from those in the control condition ($M_{adj} = 12.02$), $F(1,61) = 1.45$, $p = .233$, $\eta^2_p = .02$.

Alcohol Use

Researchers typically analyze alcohol consumption questions independently and as continuous variables to better understand the influence of each individual component (Sobell & Sobell, 1995; Breslow & Graubard, 2008). By gathering information about frequency, quantity, binge drinking episodes, highest consumption, and frequency of highest consumption, we can discern more accurate patterns of alcohol consumption.

Days Drinking. To test the effects of the intervention condition on the number of days drinking, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome number of days drinking controlling for baseline number of days drinking. Those in the true self-knowledge condition ($M_{adj} = 1.82$) did not differ from those in the control condition ($M_{adj} = 1.63$), $F(1,61) = .12$, $p = .736$, $\eta^2_p = .00$.

Drinks Consumed in Typical Night of Drinking. To test the effects of the intervention condition on the number of drinks consumed on a typical night of drinking, I

conducted an ANCOVA comparing the true self-knowledge and control conditions on

outcome number of drinks consumed on a typical night drinking controlling for baseline

drinks consumed in a typical night of drinking. Those in the true self-knowledge

condition (M_{adj} = 2.83) reported drinking significantly more drinks in a typical night of

drinking relative to those in the control condition (M_{adj} = 1.52), $F(1,61) = 6.70$, $p = .012$,

$\eta^2_p = .10$.

Binge Drinking. To test the effects of the intervention condition on the number of

days binge drinking, I conducted an ANCOVA comparing the true self-knowledge and

control conditions on outcome days binge drinking controlling for baseline days binge

drinking. Those in the true self-knowledge condition (M_{adj} = 0.693) did not differ from

those in the control condition (M_{adj} = 1.13), $F(1,61) = 1.38$, $p = .245$, $\eta^2_p = .02$.

Most Drinks Consumed in One Sitting. To test the effects of the intervention

condition on the highest reported number of drinks consumed in one sitting, I conducted

an ANCOVA comparing the true self-knowledge and control conditions on outcome

most drinks consumed in one sitting controlling for baseline most drinks consumed in

one sitting. Those in the true self-knowledge condition (M_{adj} = 3.04) did not differ from

those in the control condition (M_{adj} = 2.45), $F(1,61) = 1.33$, $p = .254$, $\eta^2_p = .02$.

Number of Days Highest Number of Drinks Were Consumed. To test the effects of

the intervention condition on the number of days the highest number of drinks were

consumed, I conducted an ANCOVA comparing the true self-knowledge and control

conditions on outcome days the highest number of drinks were consumed controlling for

baseline days the highest number of drinks were consumed. Those in the true self-knowledge condition (M_{adj} = .93) did not differ from those in the control condition (M_{adj} = .64), $F(1,61)$ = 0.89, p = .349, η^2_p = .01.

Drinking Motives

Drinking for Social Enhancement. To test the effects of the intervention condition on drinking for social enhancement, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome drinking for social enhancement controlling for baseline drinking for social enhancement. Those in the true self-knowledge condition (M_{adj} = 11.25) did not differ from those in the control condition (M_{adj} = 11.03), $F(1,61)$ = 0.98, p = .755, η^2_p =.00.

Drinking to Enhance. To test the effects of the intervention condition on drinking to enhance, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome drinking to enhance controlling for baseline drinking to enhance. Those in the true self-knowledge condition (M_{adj} = 9.65) did not differ from those in the control condition (M_{adj} = 10.15), $F(1,61)$ = 0.82, p = .369, η^2_p =.01.

Drinking to Conform. To test the effects of the intervention condition on drinking to conform, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome drinking to conform controlling for baseline drinking to conform. Those in the true self-knowledge condition (M_{adj} = 6.29) did not differ from those in the control condition (M_{adj} = 7.37), $F(1,61)$ = 3.45, p = .068, η^2_p =.05.

Drinking to Cope. To test the effects of the intervention condition on drinking to cope, I conducted an ANCOVA comparing the true self-knowledge and control conditions on outcome drinking to cope controlling for baseline drinking to cope. Those in the true self-knowledge condition ($M_{adj} = 7.81$) did not differ from those in the control condition ($M_{adj} = 8.96$), $F(1,61) = 2.76$, $p = .102$, $\eta^2_p = .04$.

Table 2a. Baseline Correlation Measures

1. State Anxiety - Time 1
2. Depression- Time 1
3. Alcohol Consumption Frequency- Time 1
4. Typical Quantity- Time 1
5. Binge Drinking Episodes- Time 1
6. Largest Number of Drinks- Time 1
7. Largest Drink Consumption Frequency- Time 1
8. Drinking Motive- Social- Time 1
9. Drinking Motive- Enhancement- Time 1
10. Drinking Motive- Conform- Time 1
11. Drinking Motive- Cope- Time 1
12. Self-Alienation- Time 1

Table 2. Baseline Correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	.7	.15	.07	.02	.06	.11	.29**	.34**	.37**	.46**	.63**
2		1	.05	.04	.00	.00	.05	.30**	.36**	.20	.42	.67**
3			1	.41**	.61**	.53**	.62**	.59**	.43**	.20	.40**	.07
4				1	.69**	.92**	.54**	.58**	.59**	.15	.45**	.06
5					1	.73**	.70**	.46**	.42**	.10	.33**	.07
6						1	.59**	.62**	.61**	.17	.41*	.04
7							1	.51**	.47**	.10	.36*	.08
8								1	.56**	.45**	.56**	.17
9									1	.41**	.67**	.32**
10										1	.41**	.27*
11											1	.41**
12												1

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

Table 3a. Outcome Correlation Measures

1. Self-Alienation- Time 2

2. State Anxiety - Time 2

3. Depression- Time 2

4. Alcohol Consumption Frequency- Time 2

5. Typical Quantity- Time 2
6. Binge Drinking Episodes- Time 2

7. Largest Number of Drinks- Time 2
8. Largest Drink Consumption Frequency- Time 2

9. Drinking Motive-Social-Time 2

10. Drinking Motive-Enhancement-Time 2

11. Drinking Motive- Conform- Time 2
12. Drinking Motive- Cope- Time 2
13. Self-Alienation- Time 3

Table 3. Outcome Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1	.52**	.59**	.09	.09	.02	.09	.09	.13	.32*	.19	.44**	.79**
2		1	.60**	-.03	-.14	.03	-.07	-.16	.08	.21	.23	.44**	.55**
3			1	-.09	-.12	.07	-.07	.07	.11	.25*	.05	.51**	.71**
4				1	.42**	.54**	.58**	.33**	.35**	.33**	-.09	-.01	-.16
5					1	.48**	.82**	.80**	.45**	.39**	.01	.08	-.12
6						1	.68**	.26*	.37**	.41**	-.02	.15	-.03
7							1	.49**	.51**	.58**	-.13	.17	-.12
8								1	.27*	.24	.14	-.00	-.04
9									1	.78**	31*	.47**	.00
10										1	.28*	.72**	.25*
11											1	.14	.01
12												1	.46**
13													1

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

Table 4. Baseline, Post-Treatment, and Outcome Means for Measures of Interest by Condition

Scale	Baseline				Two-weeks Later			
	True Self		Control		True Self		Control	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Anxiety	41.71	6.49	38.76	13.46	40.03	12.77	37.06	13.59
Depression	11.82	8.77	11.98	9.27	9.66	9.23	12.54	10.49
Drinking Frequency Days	2.02	2.36	2.48	3.09	1.84	2.34	1.67	2.61
Drinking Quantity	2.06	2.77	2.47	2.99	2.59	3.91	1.79	3.03
Binge Drinking Episodes	0.91	1.54	0.84	1.22	0.75	1.11	1.03	2.27
Largest Number of Drinks	3.09	4.08	3.62	4.06	3.00	3.61	2.58	4.12
Frequency Days Consumed Largest Number	0.71	0.81	0.74	0.61	0.94	1.76	0.64	0.74
DMQR- Social	10.24	4.56	11.69	4.78	10.84	4.70	11.55	4.44
DMQR-Enhance	9.33	4.59	10.26	4.15	9.56	4.26	10.36	3.92
DMQR-Conform	6.51	2.63	6.13	1.77	6.66	2.60	7.06	2.94
DMQR-Cope	7.96	3.72	8.35	3.80	7.88	3.54	9.00	3.94
Self-Alienation	11.73	6.48	11.64	6.67	9.59	6.08	11.36	6.47

All scores reported are sum scores

DISCUSSION

General Discussion

As numerous studies suggest, college students are at risk for heightened anxiety, depression, and dangerous alcohol use. The development of interventions that successfully address these areas of risk is therefore societally important. Many such interventions exist (Lee et al., 2014; Conely, Durlak, & Kirsch, 2015; Lewis et al., 2014), but an intervention derived from social psychological theory has been particularly useful. Specifically, interventions derived from self-affirmation theory (Steele, 1988) enhance the global integrity of people's self-concepts and broadly improve health-relevant outcomes, including stress (Sherman et al., 2009) and alcohol use (Armitage et al., 2011). However, because previous research indicates that affirming aspects of the self that reflect who a person thinks she/he truly is (i.e., the true self-concept) most effectively secures the self's integrity (Schimel et al., 2004), and because the feeling of knowing one's true self-concept is critical for its functioning (Rogers, 1959), the current project tested the efficacy of an intervention that targeted college students' perceived true self-knowledge. Participants completed baseline measures of anxiety, depression, and alcohol use prior to being randomly assigned to conditions of the intervention. On four separate occasions, those in the true self-knowledge intervention condition identified and reflected on the characteristics that they believed define who they truly are. Control participants did a similar exercise focused on an ostensibly neutral topic, items found in an office. Two weeks following the intervention, all participants reported on their anxiety,

depression, and alcohol use over the previous two weeks. I hypothesized that, controlling for baseline, participants in the true self-knowledge intervention would report lower anxiety, depression, and alcohol use relative to participants in the control condition.

The results did not support these predictions. First, there was no significant difference between participants in the treatment condition and the participants in the control condition on self-reported anxiety. However, because I measured individual differences in true self-alienation (the inverse of perceived true self-knowledge; Wood et al., 2008) at baseline and post-intervention, I was also able to test whether measured true self-knowledge predicts anxiety at each time point. Consistent with previous research (Wood et al., 2008), feelings of self-alienation were positively correlated with anxiety at all time points. The present research therefore confirms earlier work showing that greater true self-knowledge is associated with dampened anxiety. However, the designed intervention to increase true self-knowledge was not successful at reducing anxiety.

A similar pattern of results emerged on participants' self-reported depressive symptoms. There was no significant difference between participants in the true self-knowledge intervention condition and the participants in the control condition on depressive symptoms (controlling for baseline). However, once again, I replicated previous research by finding that self-reported individual differences in true self-alienation were significantly positively correlated with depression at all time points (Wood et al., 2008).

The results also did not support the hypothesis that the true self-knowledge intervention would reduce alcohol use. There was no intervention effect on the number of

days participants reported drinking, the number of self-reported binge drinking episodes, the self-reported highest number of drinks during one episode, and the self-reported number of days consuming the highest number of drinks. A significant intervention effect did emerge on the self-reported number of drinks consumed on a typical night of drinking. However, the results indicated that participants in the true self-knowledge condition reported a larger number of drinks consumed on a typical night drinking compared to participants in the control condition. This did not support my hypothesis. An analysis of the correlations between individual differences in true self-knowledge and alcohol use revealed no relationship between self-alienation and any measure of alcohol use at any time point.

Finally, the intervention did not significantly impact participants' self-reported motivations for drinking. There were no intervention effects on self-reported motives to drink due to conformity, to enhance, to cope, or to enhance social situations. However, correlations between individual differences in true self-alienation and drinking motives indicated that, at baseline, there were positive correlations between self-alienation, drinking to cope, drinking to enhance, and drinking to conform. However, at time 2, only the positive correlations between true self-alienation and drinking to cope and drinking to enhance persisted. This suggests that higher self-reports of self-alienation consistently relate to drinking to cope and drinking to enhance, such that the more self-alienated one feels, the more motivated he/she is to drink to cope and to drink in order to enhance. The novel connection between self-alienation and drinking to cope has not been previously identified in the literature but it is consistent with current research findings regarding

self-alienation, depression, anxiety, and drinking to cope. The relationship between self-alienation and drinking to cope is consistent with the positive relationship between self-alienation, anxiety, and depression, such that self-alienation is positively correlated with both anxiety and depression (Wood et al., 2008). Subsequently, anxiety and depression are both positively correlated with drinking to cope motivations (Allan, Albanese, Norr, Zvolensky, & Schmidt, 2015; Armeli, Sullivan, & Tennen, 2015). Thus, feelings of being alienated from one's true self, like anxiety and depression, may trigger alcohol use as a coping response.

Explaining the Null Intervention
Effects: An Ineffective Intervention

Although anticipated correlations between individual differences in true self-alienation and some of the outcome measures (e.g., depression, anxiety) emerged, the intervention was unsuccessful at changing the targeted outcomes across time. Why was this the case? One straightforward explanation is that the intervention was simply not effective at increasing perceived true self-knowledge. The results on the manipulation check immediately after the intervention supports this explanation. No differences in true self-alienation between intervention conditions emerged immediately after the intervention writing phase. A caveat to this interpretation, however, is that while there was no difference between conditions following the intervention, there was a significant difference between baseline self-alienation and self-alienation immediately following the intervention phase in both the intervention and control conditions. This unexpected finding suggests that something may have occurred during the intervention stage, in both

conditions, that reduced feelings of self-alienation. Alternatively, it is possible that simply responding to questions of the self-alienation scale at two time points closely related in time affects the ways that people respond to it. This could have implications for how longitudinal studies using true self-alienation measures can be implemented. For example, if there are in fact test-retest effects, this could impact any subsequent measurement of self-alienation in a longitudinal study and prevent researchers from obtaining accurate measurements of self-alienation over time. In order to accurately measure changes in self-alienation over time, we may need to consider a more indirect method or an alternative set of questions.

It is also possible that the true self-knowledge intervention may have been ineffective because it was not strong enough to successfully act as a self-affirmation. In other self-affirmation interventions, participants engage in a writing task where they elaborate on a value of importance (Sherman et al., 2009; Armitage et al., 2011). Although true self-knowledge manipulations similar to the intervention used in the present research have effectively improved well-being in an immediate context (Schlegel et al., 2011), it could be that elaboration is an essential part of an intervention effect that persists across time. To test this potential concern, participants in a future study could be asked to identify true self-characteristics and elaborate on them in a detailed fashion on the last day of the intervention. That elaboration may increase the strength of the intervention effect. Additionally, due to participant dropout between baseline and outcome, the study may have been insufficiently powered to detect subtle effects like

those predicted. Future studies should certainly aim to increase sample size and reduce participation attrition.

Additionally, of particular relevance to alcohol use outcomes, the intervention used in this experiment did not include any alcohol related health information, as has been previously employed in successful self-affirmation interventions targeting alcohol use (Armitage et al., 2011). The goal of this project was to observe the global effect of a true self-affirmation intervention on health-relevant outcomes. However, for specific health behaviors, like alcohol use, it may prove necessary to include a specific threat, such as a health message relaying information regarding the impact of alcohol use in the short term and long term. Self-affirmations can actually increase self-confidence and resistance to change when no specific threat is present or perceived (Brinol, Petty, Gallardo, & DeMarree, 2007). Thus, a future study, in addition to increasing elaboration on true self-characteristics, might also include health relevant information that highlights the threatening nature of alcohol use.

True Self-Knowledge Increases
Drinks Consumed on a Typical Night?

Related to the above idea concerning the lack of alcohol risk information, an unexpected effect of the true self-knowledge intervention did emerge on the number of drinks that participants reported consuming on a typical night of drinking. Why might this have occurred? One explanation derives from the research noted above (Brinol et al., 2007) indicating that self-affirmations in the absence of a threat can increase self-confidence and resistance to change. Perhaps individuals in the true self-knowledge

intervention consumed more drinks in a typical night because they no longer felt threatened by normal restraints on their drinking behavior (e.g., responsibilities, social pressures). For example, previous research (Abar & Maggs, 2010) indicates that the perceptions of the drinking behavior of one's closest friends predict personal drinking behavior above normative drinking behavior information. This suggests that, if an individual's friends disapprove of heavy drinking, a person's drinking behavior may respond in a congruent manner. Of course, the fact that the intervention did not successfully alter true self-knowledge casts some doubt on the merits of this interpretation. Likewise, the intervention did not affect any of the other drinking outcomes that would presumably be impacted by the same process. Thus, it is possible that this single effect is the result of Type I error, a false rejection of the null hypothesis. It will need to be replicated before confident conclusions can be drawn.

<div align="center">Concluding Remarks</div>

Self-affirmation interventions have had positive impacts on anxiety (Sherman et al., 2009), depression (Koole et al., 1999), and alcohol use (Armitage et al., 2011) Likewise, procedures that induce true self-affirmation and heightened perceived true self-knowledge positively affect meaning in life (Schlegel et al., 2011) and reactions to stereotype threat (Schimel et al., 2004). These latter studies have suggested that affirmations of true self-aspects may be most effective in certain domains. The current research, while grounded in this existing theory and research, did not provide support for the hypothesis that a true self-knowledge intervention would decrease anxiety,

depression, and dangerous alcohol use. However, consistent with previous research,
significant correlations between individual differences in true self-knowledge and anxiety
and depression were detected. These correlations provide support for the idea that
perceived true self-knowledge may play a role in mitigating the health relevant outcomes
targeted in this project. Future studies utilizing an effective intervention to increase true
self-knowledge will thus be needed to more fully understand the nature of these
relationships and the potential for true self-knowledge interventions to curtail the health
issues facing college students.

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APPENDICES

<u>APPENDIX A</u>

CONSENT FORMS

SUBJECT CONSENT FORM FOR PARTICIPATION IN HUMAN
SUBJECTS RESEARCH AT MONTANA STATE UNIVERSITY (Phase 1)

PROJECT TITLE: College Health Behaviors and Daily Writing

You are being asked to participate in a research study. For you to be able to decide whether you want to participate in this project, you should understand what the project is about and the risks and benefits involved. This process is known as informed consent. After reading this form, if you have additional questions about the study, you may contact Stephanie Leal (stephanie.leal@msu.montana.edu) for clarification prior to participating.

Explanation and Rational of Study: This study is part of a project investigating the relationship between daily writing and health behaviors. The results of this study will potentially provide information how daily writing is related to health behaviors. This information will benefit science and society by increasing our understanding of psychological factors relevant to people's everyday behaviors and thoughts. This project is not funded by any organization.

Procedures Involved: **Participation is voluntary and you can choose to not answer any questions you do not want to answer and/or you can stop at anytime.** There will be two phases to this study.

>   1). Phase 1 will be conducted over the next 5 days. On day 1 (today), you will be asked to complete a series of standard personality and health measures. The survey should take about 10 minutes to complete. On each subsequent day (i.e., Tuesday, Wednesday, Thursday, and Friday), we will email you a survey link. PLEASE CHECK YOUR EMAIL DAILY TO RECEIVE THIS LINK. You will be asked to follow the link each day and complete a daily writing exercise. The exercise will take about 10 minutes to complete each day. Thus, phase 1 of the study will take place over the next 5 days, will total about 50 minutes across the five days, and will be worth 1 research credit towards your psychology course requirements.

>   2). Phase 2 of the study will be conducted on-line 3 weeks from now. We will send you an email invitation to participate. Phase 2 will consist of a single on-line survey that will feature various personality and health-relevant measures. This survey will take about 45 minutes to complete and will be worth 1 additional research credit towards your psychology course.

Risks, Discomforts, and Costs: This study poses no foreseen risks greater than what you might experience in your everyday activity. We will be asking you to report on drinking behaviors, which, depending on your age, could mean that we are asking you to report on illegal activities. PLEASE KEEP IN MIND THAT YOU CAN REFUSE TO ANSWER ANY QUESTION THAT YOU WISH, WITHOUT PENALITY. We will take great care to protect your confidentiality (see below). We will also not ask you to report your age in the study.

Benefits: This study is of no direct benefit to you.

Confidentiality and Records: We will ask you to report the last four digits of your MSU id and your birthday (without year) in each survey. Once Phase 2 of the study has been completed, these ID codes will be deleted from the data files, making it impossible to link any of your responses to your identity. All data will be stored in password protected computer files and will not be shared with anyone outside the research team.

Compensation: As compensation for your time/effort in both parts of this study, you will receive 1 toward fulfilling a part of the Introduction to Psychology course requirements. You will receive 1 credit for completing Phase 1 and 1 credit for completing Phase 2.

Contact Information: If you have any questions regarding this study, contact Stephanie Leal via email (stephanie.leal@msu.montana.edu). If you have additional questions about the rights of human subjects, contact the Chair of the Institutional Review Board, Mark Quinn, via email (mquinn@montana.edu) or by phone (406-994-4707).

Authorization: By checking the box below, you agree that you have read the above and understand the discomforts, inconvenience, and risk of this study. You also are acknowledging that you understand that you may later refuse to participate, and that you may withdraw from the survey at any time. You may print this page for your records. If you do not wish to participate in this survey, you may simply close your browser at this time.

**SUBJECT CONSENT FORM FOR PARTICIPATION IN
HUMAN SUBJECTS RESEARCH AT MONTANA STATE UNIVERSITY
(Phase 2)**
PROJECT TITLE: College Health Behaviors and Daily Writing

This form is to remind you of your rights as a participant and the risks and benefits associated with this project.

Procedures Involved: **Participation is voluntary and you can choose to not answer any questions you do not want to answer and/or you can stop at anytime.** If you agree to participate, you will be asked to complete a series of standard personality and health related measures. You should not participate in this study if you are under the age of 18.

Confidentiality and Records: We will ask you to report the last four digits of your MSU id and your birthday (without year) in this survey. Once this Phase of the study has been completed, these ID codes will be deleted from the data files, making it impossible to link any of your responses to your identity. All data will be stored in password protected computer files and will not be shared with anyone outside the research team.

Compensation: As compensation for your time/effort, you will receive 1 research credit toward fulfilling a part of the Introduction to Psychology course requirements.

Contact Information: If you have any questions regarding this study, contact Stephanie Leal via email (stephanie.leal@msu.montana.edu). If you have additional questions about the rights of human subjects, contact the Chair of the Institutional Review Board, Mark Quinn, via email (mquinn@montana.edu) or by phone (406-994-4707).

Authorization: By checking the box below, you agree that you have read the above and understand the discomforts, inconvenience, and risk of this study. You also are acknowledging that you understand that you may later refuse to participate, and that you may withdraw from the survey at any time. You may print this page for your records.

If you do not wish to participate in this survey, you may simply close your browser at this time.

APPENDIX B

MATERIALS

What's a Standard Drink?

It is essential for our research that you describe your drinking as accurately as possible. Because drinks vary by alcohol content, to make an accurate estimate of your drinking

please use the information below to estimate how many standard drinks you had in a given time period.

One (1) standard drink equals:

12 oz. of beer	=	8-9 oz. of malt liquor (e.g., Colt 45, Mickey's)	=	5 oz. of wine	=	1.5 oz. shot of hard liquor (e.g., 80-proof vodka, whiskey, tequila, rum) Straight or mixed	=	10 - 12 oz. of malt beverage or wine cooler (e.g., Skyy Blue, Smirnoff Ice, Seagram's)
	=		=		=		=	
Typical can or bottle of beer = 1 standard drink		40 oz. of malt liquor = 4.5 standard drinks		Bottle of wine (25 oz.) = 5 standard drinks 3-4 oz. of **fortified wine** (e.g., sherry, port) = 1 standard drinks		Mixed drinks may be more than one standard drink depending on how they are mixed Pint of hard liquor = 11 standard drinks Fifth of hard liquor = 17 standard drinks		

NIAAA Alcohol Consumption Question Set

Instructions: The following questions ask about your drinking habits. **Please record your drinks in** *standard drinks* **(see Standard Drink handout).** If you have no instances of drinking for any of the questions below you may simply put a zero (0) as your response for that question.

1) In the last 2 weeks, on how many days did you drink?
    _____ days

2) During the last 2 weeks, how many standard drinks did you have on a typical day when you drank?
    _____ drinks on a typical day when I drank

3) *If you're female:* During the last 2 weeks, during a typical month how often did you have 4 or more standard drinks on one occasion or at one sitting?

OR

   If you're male: During the last 2 weeks, how often did you have 5 or more standard drinks on one occasion or at one sitting?

    _____ days a month in social settings

4) During the last 2 weeks, what is the largest number of standard drinks that you drank in a 24-hour period?
    _____ drinks in a social setting

5) During the last 2 weeks, on how many days did you drink this largest number of drinks?
    _____ days in a social setting

Drinking Motives Questionnaire-Revised

Below are a list of reasons people give for drinking alcoholic beverages. Using the scale provided (0 = *Never* through 4 = *Almost Always*), please circle which best indicates how often you drink for each of the following reasons.

	Never	Almost Never			Almost Always
	0	1	2	3	4
1. To forget your worries	0	1	2	3	4
2. Because your friends pressure you to drink	0	1	2	3	4
3. Because it helps you to enjoy a party.	0	1	2	3	4
4. Because it helps you when you feel depressed or nervous	0	1	2	3	4
5. To be sociable	0	1	2	3	4
6. To cheer up when you are in a bad mood	0	1	2	3	4
7. Because you like the feeling	0	1	2	3	4
8. So that others won't kid you about not drinking	0	1	2	3	4
9. Because it's exciting	0	1	2	3	4
10. To get high	0	1	2	3	4
11. Because it makes social gatherings more fun	0	1	2	3	4
12. To fit in with a group you like	0	1	2	3	4
13. Because it gives you a pleasant feeling	0	1	2	3	4
14. Because it improves parties and celebrations	0	1	2	3	4
15. Because you feel more self-confident and sure of yourself	0	1	2	3	4
16. To celebrate a special occasion with friends	0	1	2	3	4
17. To forget about your problems	0	1	2	3	4
18. Because it's fun	0	1	2	3	4
19. To be liked	0	1	2	3	4
20. So you won't feel left out	0	1	2	3	4

The State/Trait Anxiety Inventory

INSTRUCTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then write the number in the blank at the end of the statement that indicates how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1= not at all 2 = somewhat 3 = moderately so 4 = very much so

1. I feel calm
2. I feel secure
3. I am tense
4. I feel strained
5. I feel at ease
6. I feel upset
7. I am presently worrying over possible misfortunes
8. I feel satisfied
9. I feel frightened
10. I feel comfortable
11. I feel self-confident
12. I feel nervous
13. I feel jittery
14. I feel indecisive
15. I am relaxed
16. I feel content
17. I am worried
18. I feel confused
19. I feel steady
20. I feel pleasant

INSTRUCTIONS: A number of statements, which people have used to describe themselves, are given below. Read each statement and then write the number in the blank at the end of the statement that indicates how you generally feel. There are no right or wrong answers.
Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

1= not at all 2 = somewhat 3 = moderately so 4 = very much so

21. I feel pleasant
22. I feel nervous and restless
23. I feel satisfied with myself
24 .I wish I could be as happy as others seem to be
25. I feel like a failure
26. I feel rested
27. I am "calm, cool, and collected"
28. I feel that difficulties are piling up so that I cannot overcome them
29.1worry too much over something that really doesn't matter
30. I am happy
31. I have disturbing thoughts
32. I lack self-confidence 33.1feel secure
34. I make decisions easily 35.1feel inadequate 36.1am content
37. Some unimportant thought runs through my mind and bothers me
38. I take disappointments so keenly that I can't put them out of my mind
39. I am a steady person
40. I get in a state of tension or turmoil as I think over my recent concerns and interests

Beck Depression Inventory

Instructions: This questionnaire consists 19 groups of statements. Please read each groups of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the past **two weeks, including today**. Select the number that represents your feelings if multiple seem to apply equally well select the highest number for that group. **Do not** choose more than one statement for any group.

1. Sadness

   0- I do not feel sad. 1- I feel sad much of the time. 2- I am sad all the time. 3- I am so sad or unhappy that I can't stand it.

2. Pessimism

   0- I am not discouraged about my future. 1- I feel more discouraged about my future than I used to be. 2- I do not expect things to work out for me. 3- I feel my future is hopeless and will only get worse.

3. Past Failure

   0- I do not feel like a failure. 1- I have failed more than I should have. 2- As I look back, I see a lot of failures. 3- I feel I am a total failure as a person.

4. Loss of Pleasure

   0- I get as much pleasure as I ever did from the things I enjoy. 1- I don't enjoy things as much as I used to. 2- I get very little pleasure from the things I used to enjoy. 3- I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

   0- I don't feel particularly guilty. 1- I feel guilty over many things I have done or should have done. 2- I feel quite guilty most of the time. 3- I feel guilty all of the time.

6. Punishment Feelings

   0- I don't feel I am being punished. 1- feel I may be punished. 2- I except to be punished. 3- I feel I am being punished.

7. Self-Dislike

   0- I feel the same about myself as ever. 1- I have lost confidence 2- I am disappointed in myself 3- I dislike myself

8. Self-Criticalness

   0- I don't criticize or blame myself more than usual. 1- am more critical of myself than I used to be. 2- I criticize myself for all my faults. 3- I blame myself for everything bad that happens.

9. Crying

0- I don't cry anymore than I used to. 1- I cry more than I used to. 2- I cry over every little thing. 3- I feel like crying, but I can't.

10. Agitation

0-I am no more restless or wound up than usual. 1- I feel more restless or wound up than usual. 2- I am so restless or agitated that it is hard to stay still. 3- I am so restless or agitated that I have to keep moving or doing something.

11. Loss of Interest

0- I have not lost interest in other people or activities. 1- I am less interested in other people or things before. 2- I have lost most of my interest in other people or things. 3- It's hard to get interested in anything.

12. Indecisiveness

0- I make decisions about as well as ever. 1- I find it more difficult to make decisions than usual. 2- I have much greater difficulty in making decisions than I used to. 3- I have trouble making any decisions.

13. Worthlessness

0- I do not feel I am worthless. 1- I don't consider myself as worthwhile and useful as I used to. 2- I feel more worthless as compared to other people. 3- I feel utterly worthless.

14. Loss of Energy

0- I have as much energy as ever. 1- I have less energy than I used to have. 2- I don't have enough energy to do very much. 3- I don't have enough energy to do anything.

15. Changes in Sleeping Pattern

0- I have not experienced any change in sleeping pattern. 1a- I sleep somewhat more than usual 1b- I sleep somewhat less than usual 2a- I sleep a lot more than usual 2b- I sleep a lot less than usual 3a- I sleep most of the day 3b- I wake up 1-2 hours early and can't get back to sleep.

16. Irritability

0- I am no more irritable than usual 1- I am more irritable than usual 2- I am much more irritable than usual 3- I am irritable all the time

17. Changes in Appetite

0- I have not experienced any change in my appetite. 1a- My appetite is somewhat less than usual 1b- My appetite is somewhat more than usual. 3a- I have no appetite at all. 3b- I crave food all the time.

18. Concentration Difficulty

   0- I can concentrate as well as ever. 1- I can't concentrate as well as usual. 2- It's hard to keep my mind on anything for very long. 3- I find I can't concentrate on anything.

19. Tiredness of Fatigue

   0- I am no more tired or fatigued than usual. 1- I get more tired or fatigued more easily than usual. 2- I am too tired or fatigued to do a lot of the things I used to do. 3- I am too tired or fatigued to do most of the things I used to do.

Wood Authenticity Scale

Enter the number in the space provided that most accurately describes how you feel about yourself. Please answer as truthfully as possible, playing close attention to how you are feeling right this moment.

	1	2	3	4	5	6	7	
Not at all true of me								Very true of me

1. I think it is better to be yourself, than to be popular.
2. I don't know how I really feel inside.
3. I am strongly influenced by the opinions of others.
4. I usually do what other people tell me to do.
5. I always feel I need to do what others expect me to do.
6. Other people influence me greatly.
7. I feel as if I don't know myself very well.
8. I always stand by what I believe in.
9. I am true to myself in most situations.
10. I feel out of touch with the 'real me.'
11. I live in accordance with my values and beliefs.
12. I feel alienated from myself.

Demographics

What is your gender?
What is your ethnicity?
What race best describes you?
Is your English your native language?
Where did you grow up? City/Town and State?
Where do you consider "home"? City/Town and State?

With whom do you currently live? (circle all that apply)
- (1) Alone
- (2) Boyfriend/girlfriend/spouse/partner/
- (3) Children
- (4) Roommate(s)/friend(s)
- (5) Parent(s)/guardian(s)
- (6) Other relatives
- (7) Other (*specify*) _____

Where do you currently live?
- (1) College dormitory or residence hall
- (2) Fraternity or sorority house
- (3) Other university/college housing
- (4) Off-campus house or apartment
- (5) Parent/guardian's home
- (6) Dry cabin
- (7) Wet cabin
- (8) Other (*specify*) _____

Are you a member of a social fraternity or sorority?
- (1) Yes
- (2) No

Have you ever considered dropping out of college?
- (1) Yes
- (2) No

APPENDIX C

DEBRIEFING

Debriefing

Thank you for participating in this study. The purpose of this study was to test factors that can improve psychological and physical health in college students. Specifically, we were looking at the effect of perceived true self-knowledge.

The true self-concept is typically viewed as the characteristics that reflect who a person believes they truly are, deep down - regardless of how they may sometimes act. Perceived True self-knowledge refers to how well a person feels they know who they truly are, deep down. Feeling like you know who you truly are has important implications for mental and physical health. In this study, we are testing whether daily writing exercises that increase true self-knowledge might improve physical and mental health in college students.

At the beginning of this study, you completed questionnaires about self-reported anxiety, depression, and alcohol use. These were the mental and physical health outcomes were are interested in and your responses to these initial surveys will be used as a "base-line" measurement.

Next, each of you engaged in a writing exercise daily for 4 days. Some of you were placed in writing task condition where you were asked to write about characteristics of your true self. The other half of participants were asked to write about essential items in an office. This was our independent variable – what we have intentionally made different between people. Our goal with the writing task was to increase the perceived self-knowledge of people in the "true self" writing condition. The group were you in was determined randomly.

Finally, you completed a second survey that includes a variety of outcomes relevant to college student health. We will test whether the mental and physical well-being (e.g., anxiety) of participants in the true self writing condition is different from those who were in the "office item" writing condition. This would provide support for the effectiveness of interventions that focus on perceived true self-knowledge.
We thank you again for your time and effort. If you have any questions about the study or are curious about this research, you can contact Stephanie Leal via e-mail (stephanie.leal@msu.montana.edu).

Thanks again for your participation.