

University of Nevada, Reno

**The Additive Effects of Values Clarification Training to an  
Online Goal-Setting Procedure on Measures of Student Retention and Performance**

A dissertation submitted in partial fulfillment of the  
Requirements for the degree of Doctor of Philosophy in  
Psychology

by

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May, 2010



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We recommend that the dissertation  
prepared under our supervision by

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entitled

**The Additive Effects Of Values Clarification Training To An  
Online Goal Setting Procedure On Measures Of Student Retention And  
Performance**

be accepted in partial fulfillment of the  
requirements for the degree of

**DOCTOR OF PHILOSOPHY**

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## Abstract

The purpose of this study was to provide individuals with online tutorials to help participants generate strategies to achieve their academic goals and clarify their academic values to assess the additive effects of values clarification training to an online goal-setting training procedure on (1) measures of academic performance and (2) student retention. Psychology majors in their second year or beyond were recruited and randomly assigned to one of three groups prior to the study to receive access to one of two training modules (i.e., a goal-setting alone or a goal-setting plus values-clarification training module). The study consisted of three parts delivered approximately one month apart. Individuals responded to three brief questionnaires in Part 1. During Part 2, participants received training with one additional assessment. Training included a presentation of relevant content delivered via media clips and text with questions covering the material presented. In Part 3, participants responded to the same four questionnaires they took in Parts 1 and 2 and were then asked follow-up questions regarding their experiences in this study. Between and within-group analyses demonstrated the additive component of values-clarification training to goal-setting training significantly improved GPAs and was related to improved retention rates overall.

Key words: Goal Setting, Values Clarification, training, student retention, student performance

## Dedication

This dissertation is dedicated to the memory of my father, Ralph who left us too soon but instilled in me the value of a strong work ethic, integrity, and the importance of being a good father and role model in our short time together. This is also dedicated to my mother, Shelley and to my brother Michael who have always been so supportive and who emphasized and demonstrated the importance of pursuing my educational goals.

Lastly and most importantly, this dissertation is dedicated to my wife Stephanie whose love, support, and encouragement made this possible and to my two beautiful children, Jaden and Mackenzie who always make me laugh and smile while giving me an “excuse” to take those necessary breaks throughout this process. You are my motivation and my inspiration!

## Acknowledgements

First, I would like to thank my dissertation committee (Dr. Alavosius, Dr. Demchak, Dr. Follette, Dr. Hayes, Dr. Houmanfar, and Dr. Pistorello) for their advise, suggestions, and contributions to this project. In particular, I would like to thank Dr. Victoria Follette for providing me with the opportunity and funding to run this dissertation. I also need to specifically thank Dr. Steven Hayes for his dedication, feedback, and late nights he devoted in helping analyze the data herein. I would also like to acknowledge my appreciation for the revisions Dr. Jacqueline Pistorello suggested to be made to the original manuscript. I would be remiss if I did not express my gratefulness to Jennifer Plumb, M.S. who was instrumental in the development of the values-clarification content in this study and who helped me analyze data from the assessment batteries. I am also grateful to all of the graduate students in Dr. Houmanfar's lab who have provided me with many suggestions and feedback along the way.

Lastly, I need to express my sincere gratitude to Dr. Ramona Houmanfar who has been a true mentor (in every sense of the word) and a dear friend since I was an undergraduate student. Dr. Houmanfar has been a source of inspiration and has modeled an exemplary work ethic with the highest level of professionalism, while encouraging me to address complex scientific investigations of social importance throughout my academic career.

I thank you all!

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The Additive Effects of Values Clarification Training to an  
Online Goal-Setting Procedure on Measures of Student Retention and Performance

Student retention has increasingly become a primary interest for university administrators nationally. Low retention rates have financial implications for universities and also reflect poorly on the quality and credibility of the institution. Accordingly, there is a large body of literature exploring the individual, social, and institutional factors which impact student retention in higher education (e.g., Astin, 1984; Benn, 1982; Berger & Braxton, 1998; Johnes, 1990; Moortgat, 1997; Ozga & Sukhnandan, 1998; Pascarella & Terenzini, 1991; Tinto, 1975, 1993). The relevant research suggests that demographic characteristics, socio-economic status, individual characteristics, as well as university resources may differentially influence student decisions to drop out or to persist. Unfortunately, when it comes to helping students stay in school to complete their degrees, many U.S. colleges and universities devote insufficient resources to support retention efforts (Dale & Zych, 1996; Hood, 1999; McLaughlin, Brozoysky, & McLaughlin, 1998).

For instance, the results of a recent ACT survey (ACT, 2008) of officials at more than 1,000 two- and four-year colleges and universities indicate an alarming number of schools have no specific plan or goals in place to improve student retention and degree completion. The findings also suggest that colleges tend to put the blame for dropping out primarily on students. Moreover, many colleges have not yet made retention efforts a high priority. Specifically, fewer than half (47%) of all college officials responding to the survey reported having established a goal for improved retention of first-year students, and only a third (33%) indicate that they have established a goal for improved

degree completion. In addition, only around half (52%) acknowledge they have an individual on staff that is responsible for coordinating retention strategies (ACT, 2008).

The above mentioned data are alarming in light of other research indicating that the degree completion rate is only 40% for all four-year institutions. Further, Astin, Tsui, and Avalos (1996) report that fewer than half (47%) of students who enter four-year institutions complete the four-year degree within nine years. The data from public universities is more troubling. For instance, public universities have a degree completion rate of only 34% within four years and 40% within six years. Further, only 41% of students who enter public institutions complete a four-year degree within nine years (Astin, Tsui, & Avalos, 1996).

These alarming trends have prompted vast amounts of research into the attrition phenomenon found in higher education. For instance, education researchers have been constructing theories as to why students drop out of college since the 1970's. For example, a prominent retention theorist Vincent Tinto (1975) developed a theoretical model of student retention that is still a popular conceptualization of the attrition phenomenon in higher education today. Tinto viewed colleges and universities as organizations composed of two interacting systems: an *academic system* and a *social system*. The core of the model is the process of students' academic and social integration into the campus environment. The model holds that if there is not a balance between these processes, there is a high probability of student attrition. Of interest, results of studies investigating this theory suggest an inverse relationship. Specifically, as a student's level of social integration (e.g., extracurricular involvement and interaction with peers) increases, the importance of that student's academic integration (e.g., grades,

intellectual development, and contacts with faculty) for persistence or degree attainment diminishes (Pascarella & Terenzini, 1991).

Further research suggests that retention is related to a set of interacting factors that include high school academic performance, GPA, socioeconomic status, family support, personality traits, the size of the academic institution, and the extent and types of faculty-student interactions, as well as peer relationships (Beal & Lee, 1980; Cope & Hannah, 1975). It is important to note though that students arrive at college for the first time confronted with a multitude of challenges as well as new found independence. Students experience significant life transitions in terms of changes in their social environment and supports with the additional responsibility of making meaningful choices that impact their lives. In other words, students are confronted with competing contingencies in terms of social relationships, financial concerns, and extracurricular activities which may negatively influence performance in class and decisions to stay in school. Regardless, as individuals transition from high school to college, students need to take greater personal control of their learning, which often includes changing aspects of their academic behavior.

In this line, research has demonstrated that the more successful students are at implementing strategies that lead to personal control of their learning; the more likely they are to be successful learners (Zimmerman & Martinez-Pons, 1990; Zimmerman & Risemberg, 1997). However, it is possible that students are arriving at colleges and universities without an appropriate repertoire of self-management skills. For almost 30 years, organizational behavior scholars have advocated the use of self-management training in organizational and educational settings (Luthans & Davis, 1979; Manz &

Sims, 1980; Mills, 1983). As such, Mills (1983) defined self-management as efforts by an individual to control his or her own behavior. Self management involves assessing problems, establishing goals, monitoring time and environmental issues that may hinder the accomplishment of those goals, and using reinforcement and punishment to regulate goal progress and attainment (Frayne, 1991). Likewise, Luthans and Davis (1979) refer to self-management as the “missing link” in organizational effectiveness (p. 43). This may also be true as it applies to the performance of university students. Further, self-management programs that are specifically designed to increase the amount of time students spend studying have had positive results (Champlin & Karoly, 1975; Miller & Gimpl, 1972). However, recent research on teaching self-management in college settings appears to be lacking (Gerhardt, 2007).

#### *Goal Setting: An Industrial/Organizational (I/O) Perspective*

A primary component of self-management is effective goal setting. Goal setting is one of the simplest and most effective interventions that can be implemented to bring about desired performance and has been exhaustively studied throughout the industrial/organizational (I/O), social-cognitive, and behavioral literature. Goal-setting theory has over a 40-year history and is largely attributed to the work of Edwin Locke and Gary Latham based upon laboratory studies, field studies, and comparative investigations. A majority of the research concerning goal setting and related processes emphasizes the interplay between an individual’s conscious (or unconscious) goals and task performance. Based upon a review of the literature, Locke, Shaw, Saari, and Latham (1981) argue that goals affect performance by directing attention and action, mobilizing energy and effort, and motivating individuals to develop strategies for goal attainment.

The authors outlined seven characteristics of an effective goal-setting program which include: (1) challenging goals, (2) specific goals, (3) participants having the ability to change performance, (4) feedback on goal attainment, (5) monetary reinforcement for meeting goals, (6) a supportive manager (or experimenter), and (7) goal acceptance.

Through a further review of 239 laboratory and 156 field studies with over 40,000 individuals, Locke and Latham (1990) explain goal setting in terms of the relationship between conscious performance goals and task performance. One of the most robust findings in the literature is that individuals who set a *specific, challenging goal* increase their performance significantly over that of individuals who are simply encouraged to “do their best” (Locke & Latham, 1990). Other proposed variables that influence the effectiveness of goal setting include: participation in goal setting (assigned vs. participatory or individually set), task complexity, incentives, feedback, and learning vs. performance goals (Locke & Latham, 2002).

Locke and Latham (1990) further posit three motivational mechanisms by which specific challenging goals produce their effect: *choice, effort, and persistence*. The authors suggest that goal specificity facilitates choice by directing action toward behaviors that are relevant to achieving a goal and by excluding actions that are not goal-relevant. Further, setting specific, challenging goals results in appropriate effort because having a reasonably difficult goal requires individuals to adjust their effort to the level of the goal. When individuals set specific goals they tend to persist in their efforts until the goal is attained. Locke and Latham (2002) further contend that goals are *directive* in that goals direct attention and effort toward goal-relevant activities and that people exert greater effort to attain more difficult than easier goals. The authors also suggest that

challenging goals lead to prolonged effort and goals facilitate the development, discovery, and/or use of task-relevant strategies and knowledge. Moreover, it is argued that the goal-performance relationship is influenced by three moderators: *personal commitment*, *feedback on goal attainment*, and *task complexity*. Personal commitment is influenced by how important the goal is to the individual and by their *self-efficacy* (Bandura, 1997). Feedback on goal attainment allows the individual to evaluate the relationship between current performance and their goal. Locke and Latham (1990) suggest that feedback regarding progress toward goals can further motivate individuals to keep taking necessary actions towards their desires. Finally, more complex tasks require a greater variety of skills and strategies to accomplish goal (Locke & Latham, 2002).

#### *Goal Setting and Self-Regulation: A Social-Cognitive Perspective*

From the social-cognitive theoretical framework, Bandura (1986) suggests that people are able to control their thoughts, actions, and feelings through a specific “self-system”. The self-system allows people to consistently make decisions, take actions, and have more control over their lives. According to Bandura (1993), once selected goals are fulfilled, people tend to feel self-satisfaction from the process. Two key constructs from social-cognitive theory which attempt to explain the effects of goal setting include an individual’s *self-efficacy* and *outcome expectations*. *Self-efficacy* is part of a larger theoretical framework (i.e., social-cognitive theory) that refers to task specific self-confidence and is defined as, “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performance” (Bandura, 1997, p. 319). In other words, self-efficacy refers to beliefs about one’s capabilities to learn or perform behaviors at designated levels. Bandura (1997) and others (Schunk,

1990; Zimmerman, 2001) have posited a reciprocal relationship between students' goal-setting behavior and their perceived self-efficacy. Research has also demonstrated that self-efficacy predicts students' academic motivation and learning (Pajares, 1996, Schunk, 1995, 1996). Self-efficacy beliefs mediate decisions about commitment to goals, choice of actions to achieve goals, interpretation of feedback, and persistence (Stumpf & Rindova, 1997). Of interest, Bandura (1986) argued that students with low self-efficacy for learning may avoid learning tasks.

The second construct from social-cognitive theory explaining the effects of goal setting is *outcome expectations* which is defined as, "a person's estimate that a given behavior will lead to certain outcomes" (Bandura, 1977, p. 79). Research has shown that people become more committed to goals when goal attainment leads to valued rewards (Bandura, 1997). These concepts have led to work in self-regulated learning. Self-regulation refers to individual's active involvement in generating goals; monitoring and evaluating their progress; and adjusting their strategies for meeting the goal when necessary (Bandura, 1986, 1991; Schunk, 2001; Zimmerman, 2001). Self-regulatory theory asserts that an individual's self-regulatory skills require that a student's goals be realistic, challenging yet attainable.

#### *Goal Setting: A Behavioral Perspective*

The I/O and the social-cognitive explanations of goal setting may be deemed as insufficient to behavioral researchers in that the behavioral histories that give rise to the observed effects are not specified and the cognitive intentions of an individual cannot be objectively observed. In addition, Locke's model is difficult to empirically test. Specifically, Locke (1968) noted that cognitive intentions and goal setting cannot be

measured directly but must be inferred by (1) assigning goals and asking participants whether they accept the goals; (2) giving participants a limited choice of goals and asking them to choose one; and (3) allowing participants to set their own goals and asking them what goals they have set. As such, Huber (1985) has argued that the model's central proposition (viz., that subconscious personal goals moderate the relationship between environmental events and behavior) cannot be tested. Huber's argument holds that no method exists to examine an individual's subconscious and therefore their goals and intentions must be inferred from verbal reports.

It should be noted however that a behavioral account does not deny private/unobservable events. Neither does a behavioral account attribute the cause of behavior to hypothetical, nonphysical events which in principle are unobservable. Rather, a behavior analytic perspective focuses on observable behaviors as dependent variables. Accordingly, a behavioral approach to explain a given phenomenon systematically examines each component of a behavioral contingency. A goal-setting contingency (like all operant contingencies) includes four elements (i.e., an establishing operation, a discriminative stimulus, the target behavior, and the consequence of the behavior) which must be systematically examined (Huber, 1985). Interestingly though, there is some disparity in the behavior analytic literature regarding the function of goals, goal statements, and goal achievement, and further, these terms are often used interchangeably.

For instance, goals have been described as establishing operations (EOs; Michael, 1993) by Agnew (1998) who suggested that goal statements may function as EOs due to their ability to alter the value of consequent stimuli. However, it should be noted that

EOs have both an *establishing* effect and an *evocative* effect (Michael, 1993). Goals have also been referred to as discriminative stimuli (SDs) which are stimuli in the presence of which a response has been reinforced (and in the absence of which a response has not been reinforced), that evoke behavior by signaling the availability of reinforcement (Agnew, 1998).

In this line, Fellner and Sulzer-Azaroff (1984) contend that when a goal statement reliably accompanies a reinforced response, it acquires discriminative control over that response such that the presence of the goal statement increases the probability of goal directed behavior. When a particular stimulus (e.g., a goal statement) precedes or accompanies a reinforced response, that stimulus gradually may begin to assume controlling properties, eventually serving to set the occasion for the emission of the response. Goals that have consistently been paired with a reinforced response should occasion that response under similar conditions. Fellner and Sulzer-Azaroff (1985) further suggest that goal setting constitutes only the arrangement of antecedents to behavior. The authors contend that in the absence of other strategies, goals should exert control only to the extent that individuals have experienced a history of reinforcement as a consequence of adhering to goals (Fellner & Sulzer-Azaroff, 1985). Others have suggested that goal setting plus feedback is more effective than goal setting alone (Erez, 1977; Ivancevich, 1982; Komaki et al., 1977).

Goals have also been described as conditioned reinforcers (Fellner & Sulzer-Azaroff, 1984). That is, when meeting a goal is repeatedly correlated with a positive consequence (or the removal of a negative consequence), goal achievement can function as a conditioned reinforcer. However, goals do not always occasion or reinforce

behavior. That is, if goal achievement is not reinforced in the presence of the goal statement, the goal statement will not acquire discriminative control over behavior and goal achievement will not function as a conditioned reinforcer.

Finally, goals have been referred to as a special type of rule. Skinner (1969) introduced the term rule-governed behavior and defined rules as contingency specifying stimuli (CSS). Contingency specifying stimuli are useful because they evoke desired behavior even if an individual has no direct experience with the contingency. While many stimuli acquire discriminative properties as a result of an individual's reinforcement history, stimuli also may acquire discriminative properties when the conditions under which a response will be reinforced or punished are described by another person or in a written description (Galizio, 1979; Skinner, 1969, 1974). Rules or goal statements may evoke behavior quicker than that which occurs as a result of direct experience with the contingency (i.e., contingency shaped behavior). Moreover, the function of goal statements may be influenced by rule-governed behavior. That is, behavior under instructional control may be more efficiently managed because each response does not need to be independently shaped.

Rule-governed behavior is especially important in cases of indirect acting contingencies when the consequence of behavior (e.g., goal achievement) is improbable or long-deferred. In this line, Malott (1992) distinguished between *effective* and *ineffective* natural contingencies. Malott suggested that direct-acting contingencies are effective in that the contingency is one in which the outcome of a given response reinforces or punishes that response. Conversely, indirect-acting contingencies are ineffective in that the contingency is one in which the outcome is too delayed or

improbable to directly reinforce or punish that response. In such cases, rules (or goal statements) allow for self-statements about reinforcement to maintain behavior until reinforcement occurs. In other words, rules describing indirect-acting contingencies allow such contingencies to maintain behavior. Interestingly, Malott (1992) agreed with the contention that some rules function as discriminative stimuli (e.g., Fellner & Sulzer-Azaroff, 1984), but also conceded that sometimes rules control behavior because, “a rule statement might function as a conditioned establishing operation that establishes noncompliance with the rule as a learned aversive condition” (Malott, 2001, p. 54). For example, beginning to work on one’s homework can be understood from Malott’s perspective as an escape response that alleviates a learned aversive conditioned. For instance, Malott (1992) suggested that all operant control may require direct-acting escape contingencies to be effective even when rules describe the indirect-acting contingency because delayed, indirect-acting contingencies will not control behavior by themselves.

Of interest, operant principles suggest that the success of contingency-specifying stimuli (rules or goal statements) in evoking behavior depends upon six factors: (1) the availability of alternative discriminative stimuli, (2) magnitude and frequency of reinforcement, (3) salience of the contingency, (4) multiple discriminative stimuli, (5) experience with the contingency, and (6) participation in designing the contingency (Huber, 1985). For behavior to maintain, it must be reinforced. Even when reinforced however, it may not occur on all occasions since reinforcement increases the probability, but does not guarantee that behavior will occur in all instances and situations. In addition, it is also possible that anticipated behavior will not occur if another operant

contingency has evoked another class of operants. That is, the competing contingency may be more powerful because the individual has had more experience with the competing contingency; the reinforcer is more powerful, or the discriminative stimulus is more specific or salient (Huber, 1985). Finally, research suggests that feedback about one's progress toward a goal is necessary but not sufficient to evoke or maintain behavior (Fellner & Sulzer-Azaroff, 1984; Komaki, 1981). It is also important to note that throughout all of the aforementioned literature, the positive effects of goal setting are often confounded with other variables including feedback and consequential manipulations. The effects of goal setting are rarely analyzed in isolation.

Nonetheless, from the current perspective an overarching life goals (i.e., Values) functions as an establishing operation (EO). That is, a goal has both an establishing effect (e.g., goal achievement as a reinforcer) and an evocative effect (e.g., evokes relevant behavior toward goal achievement). The overarching goal typically occasions goal statements. Once the goal statement has been made (verbally or otherwise), the goal statement then functions as a discriminative stimulus by occasioning relevant, goal-directed behavior and may signal the availability of reinforcement. Goal achievement then functions as a conditioned reinforcer (assuming a history of goal achievement as a reinforcer) which maintains goal-directed behavior.

#### *Goal Setting: A Relational Frame Theory (RFT) Perspective*

Perhaps adding some clarity on the subject, O'Hora and Maglieri (2006) provide a novel behavioral account of goal setting from a Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001) perspective. RFT is a precise and empirically substantiated theory of language and cognition. Derived stimulus relations are the core

processes of language from this perspective insofar as these predictable, untrained relations provide an explanation of the productive quality of verbal behavior. Derived relations refer to relations between stimuli that are not trained directly but are observed reliably given the training of other relations in particular contexts (e.g., stimulus equivalence). These relations include opposition, difference, more than/less than, before/after, etc. Verbally able humans respond to non-arbitrary and arbitrary relations between stimuli. Non-arbitrary relations between stimuli are those relations that depend on the physical, temporal, and spatial properties of stimuli. From an RFT perspective, arbitrarily applicable relations between stimuli comprise the functional heart of language behavior.

Thus, when an individual understands a goal statement, it functions as a rule, or from an RFT perspective, a relational network. Hayes and Hayes (1989) contend that rule governance might be explained in terms of responding in accordance with a network of derived relations between words and environmental stimuli. That is, when environmental stimuli participate in derived relations with words in presented rules and the functions of those stimuli are transformed such that when a person comes into contact with the transformed stimuli, particular responses may then be controlled by them (i.e., the responses specified by the rule). However, when a level of performance is included in a goal statement, behavior becomes more complex. Arbitrary relations are established between the level of performance prescribed by the goal statement and the individual's ongoing self-statements about current performance. That is, the "less-than" relation allows for derived reinforcement of goal directed behavior (O'Hora & Maglieri, 2006).

Of relevance, Zettle and Hayes (1982) furthered Skinner's account of rule-governed behavior by analyzing the types of contingencies that maintain that behavior. The authors suggested that the three primary functional units of a "listener's" behavior are *pliance*, *tracking*, and *augmenting*. Pliance is rule-governed behavior under the control of speaker-mediated consequences (p. 80). Tracking is behavior under the control of the correspondence between the rule and the way the world is arranged and augmenting refers to rule-governed behavior under the control of changes in the capacity of events to function as reinforcers or punishers (p. 81). Hayes, Zettle, and Rosenfarb (1989) further contend that goal statements function as a particular type of rule called a *motivative augmental*. In an educational environment, repertoires of pliance and tracking allow for goal statements to increase performance. O'Hora and Maglieri (2006) further contend that a mix of pliance and tracking is beneficial. Specifically, the authors argued that pliance is ideal for setting up short-term contingencies for smaller, high rate tasks, but this could be supported by tracks that describe longer-term contingencies for more complex, lower rate tasks (p.162). Furthermore, feedback on performance (either self-stated or other delivered) is transformed such that it acquires derived reinforcing properties. Repertoires of rule following must support the derived reinforcing properties of feedback established by goal statements. Without such behavioral histories, behavior will not change reliably with respect to goal statements (O'Hora & Maglieri, 2006).

However, an RFT account may further explain how goal-directed behavior is maintained in the absence of a tangible consequence. In the absence of external rewards and reinforcers, the behavior of some individuals may be reinforced by "achievement". That is, when an individual has spent time working in order to decrease the *comparative*

relation (i.e., less-than) between ongoing self-statements and goal statements, *achievement* occurs once the self-statement and goal statement are in a relation of *coordination*. Stated another way, when individuals are provided with goals they strive to decrease the verbal distance between their current performance level and that specified by the goal. This behavior may be maintained by contingencies for obedience to the goal setter or by environmental contingencies either explicitly described in the goal statement or abstracted by the individual (O'Hora & Maglieri, 2006). Some individuals have histories in which achievement has predicted a high level of reinforcement relative to other sources of reinforcement available for the individual's behavior. This achievement-reinforcement relation will often be supported by natural contingencies. For such individuals, achievement will be a strong reinforcer and this may maintain goal-directed behavior in the absence of explicit reinforcement (O'Hora & Maglieri, 2006).

*Values: An Acceptance and Commitment Therapy (ACT) Perspective*

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2003) is a therapy derived from the work in RFT. ACT helps individuals focus on their values and the committed actions that may move their lives in valued directions. ACT applies acceptance and mindfulness processes, commitment, and behavior change processes to the creation of psychological flexibility, and encourages one to change or persist in behavior when doing so serves valued ends. Values from this perspective are assumed to alter an individual's relationship to adversity and increase vitality by engaging people in activities that matter to them (Wilson & Murrell, 2004). Moreover, values clarification can change the function of difficult tasks from something to be avoided to something one chooses to approach in the service of a larger life goal. Further, values-based

interventions have demonstrated an increase in overall quality of life and engagement in valued activities (Hayes et al., 2004). From this perspective, values are more abstract and global than concrete verbal goals. That is, “values cannot be fully satisfied, permanently achieved, or held like an object. They tend to be relevant over very long time frames, in many situations, and are less subject to satiation and change” (Hayes, Strosahl, & Wilson, 2003, p. 207). As such, values are viewed as something distinct from goals.

The core processes in ACT include: *acceptance, cognitive defusion, being present, self as context, values, and committed action*. From an ACT perspective, values are chosen qualities of purposive action that can never be obtained as an object but can be instantiated moment by moment (Hayes et al., 2004). ACT uses a variety of exercises to help individuals choose life directions in various domains (e.g., family, career, education, etc.) while undermining verbal processes that might lead to choices based on avoidance, social compliance, or fusion. Further, values clarification can help individuals make choices about concrete behaviors that would be in service of their values. From this perspective, behavioral commitments and committed action are similar to goal-directed behavior in that ACT encourages the development of larger and larger patterns of effective action linked to chosen values. Concrete goals from this perspective are values-consistent.

From a broader context, values refer to students’ beliefs about the importance of learning or what use will be made of what they learn. Value beliefs affect behavior since learners show little interest in activities they do not value (Schunk, 2003; Wigfield, 1994). Moreover, people are likely to act when they believe an action will produce positive outcomes and when they value those outcomes (Atkinson, 1964; Vroom, 1964).

Therefore it is assumed that students who value high grades and believe diligent studying will produce those grades are more likely to engage in studying behaviors.

Of interest, ACT can be delivered practically and efficiently in college settings. As such, ACT may be particularly well suited as a preventative intervention with college students. Of further relevance to the current study, ACT is sometimes referred to as Acceptance and Commitment *Training* when applied to non-clinical populations (e.g., college students) and has been shown to be effective when used in this fashion in several studies (e.g., Hayes et al., 2004; Hayes et al., 2006).

### *Background and Significance*

In the current economic climate, one of the foremost ways to garner employment and maintain a competitive advantage is to earn a college degree. A college degree does not necessarily guarantee that individuals will find their ideal job, but it does prepare them for their career pursuits. Additionally, college graduates enjoy several advantages over their non-college-educated counterparts including more career options, better promotion opportunities, higher salaries, and lower unemployment (Dohm & Wyatt, 2002). For instance, the U.S. Bureau of Labor Statistics (2010) reported that in the fourth quarter of 2009, “full-time workers age 25 and over without a high school diploma had a median weekly earnings of \$449, compared with \$638 for high school graduates, and \$1,121 for those holding at least a bachelor’s degree” (p. 1). This is contrasted with the highest earning ten percent of male workers who made \$3,342 or more per week in 2009 compared with \$2,156 or more for their female counterparts (BLS, 2010, pp. 1-2). While there continues to be an obvious earnings disparity between males and females, a college degree helps bridge this gap between college and non-college educated individuals.

Further, a report from the U.S. Census Bureau indicates that over the course of one's working life, adults are likely to have higher earnings the more educated they are. High school dropouts have the lowest expected lifetime earnings compared with workers at all other levels of educational attainment and financial gains are predicted at each successive level of schooling completed. For example, high school graduates are estimated to earn \$1.2 million over the course of their lives. This is contrasted with individuals holding a bachelor's degree earning \$2.1 million, a master's degree earning \$2.5 million, and a doctoral degree earning \$3.4 million in expected lifetime earnings. Of interest, individuals with a professional degree are expected to earn \$4.4 million over the course of their working lives. (U.S. Census Bureau, 2002)

In addition to monetary incentives, there are several reasons to pursue a college degree (e.g., personal prestige, peer and family influences, employment opportunities, etc.). While the process is both expensive and time consuming, college graduates usually see a return on their investment. However, national retention rates of students who have initiated pursuit of a bachelor's degree are disconcerting. Specifically, the national retention rate of public, four-year institutions is 65.6% (U.S. Department of Education, 2007). In other words, approximately 35% of students who enter higher education do not persist and complete the requirements to obtain a college degree.

Locally, the retention rates for the University of Nevada, Reno (UNR), the College of Liberal Arts, and the Psychology Department from the fall 2008 to the fall 2009 semester are more encouraging (Chenin, UNR Institutional Analysis, 2010). For example, retention rates for freshman at UNR were slightly better than the national average (79.6%). Of more pertinent interest, retention rates of freshman, psychology

majors at UNR are somewhat higher at 80.2% (Table 1). Conversely, the retention rates of psychology majors who are retained in the department dramatically declines (47.2%) during their freshman year. This suggests that although over 80% of psychology majors are retained at the University during their freshman year, they are changing their major and even leaving the college. Furthermore, attrition rates for UNR students increase when they are followed through to their sophomore year. For instance, the overall retention rate of all sophomores at UNR during this same time period plummeted to 68.4% while the retention rate of psychology majors who were retained as freshman waned to 76.5% at the University level or to 78% (of the 47.2%) retained within the department (Table 1).

### *Purpose*

The preceding indicates that when it comes to retaining students, universities are underperforming. Retention and persistence are important issues that impact not only colleges and universities, but our entire nation in terms of its future competitiveness in the global economy. In other words, when a student drops out of an institution for higher education, everyone loses (e.g., the future earning capacity of students who drop out, the university and the greater society in general). Therefore, it is imperative for universities to develop cost-effective retention programs. A retention program refers to planned institutional actions that devote college or university resources (i.e., funding, personnel time, and space) to the aim of increasing student persistence. It is possible that goal-setting interventions and/or values-based interventions are effective components of a retention program to decrease attrition rates and improve student persistence. Interestingly, the majority of the retention literature to date focuses on financial concerns

(Kerkvliet & Nowell, 2004), advising, student-faculty interactions, student services, classroom environments, reducing stress (Stover, 2005), minority status (Seidman, 2005; Lee, 1999); however, only a few have incorporated academic performance as a primary measure into their analysis (e.g., Bowen, Price, Lloyd, & Thomas, 2005; Thomas, 2002; Tinto, 1975, 1982).

Of further interest, while it is recognized that many universities are not doing enough to retain students; ironically, students who perform poorly and who could benefit most from additional support are the least likely to seek additional assistance. For example, Karanbenick and Knapp (1988) found a curvilinear relationship between help seeking and academic need. Their results indicate that the rate of help seeking increased from a low to moderate need (maximizing in the B- to C+ grade range) and then decreased with high need levels. Additionally, individuals who could benefit the most from academic assistance may avoid these opportunities due to a perceived stigma associated with help seeking. Furthermore, many individuals perceive themselves as effective goal setters or would argue that they know what their values are, but fail to engage in behaviors that characterize successful goal-setting processes or ever clarify their values. Instead, they oftentimes set vague or unreasonable goals, have a low commitment to their goals or values, and seek feedback rarely, if at all.

Alternatively, Sheldon and colleagues suggest that goals rooted in personal interests and values are regularly associated with greater success (Sheldon & Elliot, 1998, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1998). It is asserted that a reason for ineffective goal pursuit is that individuals fail to develop specific action plans for how to attain their goals. They fail to specify when to initiate goal pursuit and how to

ensure persistence in the face of distractions and obstacles (Gollwitzer & Brandstatter, 1997). Schunk (2003) further argued that teachers need to develop students' goal-setting and self-evaluation skills and that direct instruction on goal setting may be necessary until students can set realistic goals for themselves.

It is also reasonable to suggest that students tend to drop out because their expectations of college (academically, socially, or both) do not correspond with the reality once they get there. Therefore, it is further assumed that academic goal-setting and academic values-clarification interventions may affect individuals by providing structure to ambiguous academic situations. Accordingly, the aims of this study were to specifically assess the additive effects of values clarification training to an online goal-setting training procedure on measures of (1) academic performance and (2) student retention and persistence.

## Method

### *Experimental Design*

A mixed between- and within-group, with a waitlist and a comparison group design was implemented in the current study. The experimental groups included a goal-setting training group (GS; N=48), a goal-setting plus values-clarification training group (VC1; N=51), and a waitlist control group that received goal-setting plus values-clarification training (VC2; N=33; note that the VC2 Group participated in Part 1 of this study during the spring 2009 semester with the GS and VC1 groups but did not receive training (Part 2) or follow-up (Part 3) until the fall 2009 semester). With respect to the comparison group, this group included all psychology majors in their second year or beyond who did not participate in this study during the spring 2009 (N=286) or fall 2009

(N=161) semesters of which only archival educational data were available. It should be noted that individuals in fall 2009 comparison group were the same individuals from the comparison group in the spring; however, this separate comparison group was created for the fall 2009 semester due to student attrition and graduation (i.e., 125 students) in the spring 2009 semester. First year psychology majors were excluded from the current investigation to avoid cross-contamination with another concurrent study with a similar intervention component (i.e., values clarification) that targeted all first year students.

### *Participants and Setting*

Prior to the spring 2009 semester, all declared psychology majors (18 years of age or older) in their second year or beyond were randomly assigned (through a stratified randomization procedure) to one of three groups and received an email invitation inviting them to participate in an *Academic Goal-Setting Training Module* (Appendix A) or in an *Academic Goal-Setting plus Values Clarification Training Module* (Appendix B). The VC2 group was asked to participate in Part 1 of the study in the spring 2009 semester but informed that Parts 2 and 3 would not be made available to them until the fall 2009 semester (Appendix C).

Individuals were able to sign-up for this study through the university's online subject pool (<http://unr.sona-systems.com/>) where the experiment was listed for prospective participants. Participants were informed that we were conducting a three-part study to help students develop strategies to achieve their academic goals and clarify their academic values to improve retention rates and academic performance at the University of Nevada, Reno. Individuals were able to participate and interact with the modules through any computer with Internet access.

*Compensation.* Participants earned one Psychology Experience Credit (PEC; up to three) for their participation in each part of the study. In addition, participants earned one entry (up to three) into a raffle for each part of the study that they participated in. Individuals were informed that they would be entered into a drawing for \$50 gift cards from the ASUN Bookstore, Target, Best Buy, a gas card, and a grand prize of an i-Pod touch.

*Demographic characteristics.* The demographics for each of the individual experimental groups (i.e., GS, VC1, and VC2) were comparable. No notable differences were observed amongst the experimental groups. As such, an aggregate of the groups is presented in the following. Participants (N=132; GS, VC1, and VC2 groups) were primarily between the ages of 19 – 22 (78%,  $SD=12.04$ , range 18->25), female (78%,  $SD=52.33$ ), Caucasian (70%,  $SD=33.01$ ; 4% African American, 5% Alaskan/Native American, 2% Asian, 8% Latino/a, 11% Unspecified), in their second or third year in school (77%,  $SD=11.53$ ) and enrolled as full-time students (89%,  $SD=56.67$ ). Students who did not participate in this study (N=447; comparison group) consisted of a similar demographic make-up as the experimental groups with the exception of their age and their year in school. Individuals in the comparison group were predominately older than 22 years of age (58%,  $SD=28.54$ ), female (62%,  $SD=78.49$ ), Caucasian (61%,  $SD=94.59$ ; 5% African American, 5% Alaskan/Native American, 5% Asian, 9% Latino/a, 15% Unspecified), in their fourth year of school (54%,  $SD=82.40$ ), and enrolled as full-time students (72%,  $SD=143.77$ ).

*Procedure: Part 1*

*Pre-assessment batteries.* Part 1 of this study was available to all psychology majors in their second year or beyond in early February 2009 for four weeks and required approximately 30 minutes to complete. Individuals who were interested in participating in Part 1 of this study were able to click on the embedded links in the email invitation to sign up for the study through SonaSystems and to enter the module. Individuals who did not participate were then incorporated into the comparison group. Once participants entered the module, they had to read and agree to the terms of an information sheet before they could proceed. The three pre-assessment batteries in Part 1 included the *Depression, Anxiety and Stress Scale 21 (DASS 21)*, the *Quality of Life Scale (QOLS)* and the *Acceptance and Action Questionnaire-2 (AAQ-2)* (Appendices H - J). Participants responded to questions from the assessment batteries by clicking on Likert-type, multiple-choice answer options. At the completion of this module, participants were thanked for their time, informed that they would receive another email inviting them to participate in Part 2 of this study, and that they had received one PEC and one entry into the raffle (the VC2 participants were informed that they would receive another email inviting them to participate in Part 2 of this study early in the fall 2009 semester, and that they had received one PEC and one entry into the raffle for their participation).

*Procedure: Part 2*

*General overview of the training modules.* Individuals from the GS and VC1 groups that participated in Part 1 received another email inviting them to participate in the second part of this study (Appendices D & E). Part 2 of this study was available to the GS and the VC1 groups in early March 2009 (and the VC2 Group in early September

2009) for four weeks and took approximately 30-45 minutes to complete. Individuals who were interested in participating in Part 2 of this study were able to click on the embedded links in the email invitation to sign up for the study through SonaSystems and to enter their respective module. After consenting to participate, individuals were introduced to a presentation of relevant content (from either the goal-setting literature or both the goal-setting and the values-based ACT literature) delivered via media clips with corresponding text embedded. The content was condensed into small segments of information followed by one question covering the material just presented. Next, individuals were asked to either set academic goals (GS Group) or clarify their academic values *and* set academic goals (VC1 and VC2 groups) depending upon which group they were in. Both modules concluded with one additional assessment battery (i.e., the *Personal Values Questionnaire - PVQ* for the VC1 and VC2 groups - Appendix K; and the *Personal Goals Questionnaire - PGQ* for the GS Group - Appendix L). Individuals were then thanked for their participation in this study and informed that another email invitation letter would be sent out in April 2009 (October 2009 for the VC2 Group) inviting them to participate in Part 3 of this study as a follow-up, and that they had received one PEC and an additional entry into the raffle.

*The academic values-clarification module.* Only the VC1 and VC2 groups were exposed to academic values-clarification training (in addition to the goal-setting training). Specifically, participants were provided with information from the ACT literature to occasion the participant to begin to reflect upon their values and what is important to them. Specifically, participants were provided with a definition of values from the ACT perspective via an audio clip with corresponding text embedded on the screen. Then,

participants were asked to answer questions regarding the definition. In addition, content was provided indicating what values are not, with an emphasis describing that they are not goals. Participants were then instructed to answer a few questions regarding what values are not. At this point, participants were prompted to write about their academic values. This was followed by two additional ACT metaphors (*Bringing Education Values into the Present* and *Tending a Garden*) after which participants were prompted to write about their academic values. To remain consistent with the literature, values clarification training was followed by goal-setting training (see below). The values-clarification training module concluded with the *PVQ* (Appendix K) and an optional self-management component.

*Optional self-management component.* Participants were prompted to self-monitor their behavioral commitment to their academic values on a weekly basis at the conclusion of the module. An optional *values-clarification calendar* (Appendix N) was generated of which participants were able to print off to track how consistently they had been living in accordance with their stated academic values. The *values-clarification calendar* was a MS<sup>®</sup> Word document that prompted participants to state their academic value(s). The calendar provided space to include the month and specific academic value at the top. Participants were asked to indicate on a weekly basis to what extent they had been living in accordance with their stated value. The purpose of this instrument was to prompt individuals to assess their behavioral commitment to their academic value(s) and to measure how consistently they had been living in accordance with their stated academic value(s) on a weekly basis. However, this was not a mandatory component of

the study and was offered as an additional resource for effective self-management practices.

*The academic goal-setting module.* All experimental groups (i.e., GS, VC1, and VC2 groups) were exposed to academic goal-setting training. Specifically, all participants were provided with information from the goal-setting literature, and on proximal, intermediate, and distal goals, as well as how to set challenging *SMART* (specific, measureable, attainable, realistic, and time-orientated) goals via media clips with embedded text that corresponded with audio files. Participants were asked one question following each segment of information. Participants were then prompted to set a long-term/distal goal (next 2-3 years or after graduation); an intermediate goal (end of the semester); and proximal *SMART* goal(s) to meet their intermediate and distal goals. After *SMART* goals had been selected, participants were asked to list potential obstacles (competing contingencies) of goal achievement and possible solutions for each obstacle. Participants were asked why the goal was important to them as an individual as well of the potential benefits of achieving their goal. Participants were then asked to provide specific action steps to achieve their goal (e.g., what is the action? when it is expected to be completed? etc.). The goal-setting module concluded with the *PGQ* (only for the GS group - Appendix L) and an optional self-management component.

*Optional self-management component.* Participants in the GS group were also prompted to self-monitor their academic goal-relevant behavior on a daily/weekly basis at the conclusion of the module. A *goal-setting calendar/planner* (Appendix M) was generated of which participants had the option to print off to occasion goal-relevant behavior. The *goal-setting calendar/planner* was a MS<sup>®</sup> Word document that prompted

participants to set deadlines and list other events which may interfere with achieving their academic goals. The calendar included space for the month and specific academic goal at the top. Participants were asked to indicate important deadlines on the calendar (e.g., tests, quizzes, papers due, etc.) and to set and write out daily (*SMART*) goals (e.g., hours per day studying, writing, etc), as well as other competing contingencies (other classes, work, social events, etc.) which may interfere with “Realistic” (R) goals for a given day. Individuals were provided with space to indicate whether a goal for a given day was achieved or not. The purpose of the *goal-setting calendar/planner* was to encourage individuals to set daily goals to achieve their intermediate and distal goals. However, this was not a mandatory component of the study and was offered as an additional resource for effective self-management practices.

*Procedure: Part 3*

*Post-assessment batteries and follow-up.* Individuals who participated in Parts 1 and 2 of this study were invited to participate in Part 3 of this study via an email invitation letter (see Appendices F & G) sent out one month following the close of Part 2 of the study (April 2009 for the GS and VC1 groups and October 2009 for the VC2 group). Part 3 of this study was available for four weeks and took approximately 30 minutes to complete. Individuals who were interested in participating in Part 3 could click on the embedded links in the email invitation to sign up for the study and to enter their respective module. Once they had entered the module, participants had the option to read and agree to the terms of an information sheet before they could proceed.

The modules in Part 3 for all groups were comparable to that of Part 1 with the addition of the respective assessment battery (i.e., the *PVQ* or the *PGQ*) from Part 2 and

additional follow-up and participant satisfaction survey questions. Specifically, Part 3 for all groups began with the same three assessment batteries (i.e., *DASS 21*, *QOLS*, and the *AAQ-2* - see Appendices H - J) that they took in Part 1. These batteries were followed by the *PGQ* (Appendix L) for the GS group and the *PVQ* (Appendix K) for the VC1 and VC2 groups. Part 3 concluded with questions inquiring about the participant's experiences in this study and if their participation helped them achieve their academic goals or live in accordance with their academic values. At the completion of this module, participants were thanked for their time, informed that they had received one PEC and one additional entry into the raffle, and informed that they would be notified via email if they had won any of the prizes in the raffle in mid-May 2009 (mid-November 2009 for the VC2 group).

#### *Independent Variables*

*Academic goal-setting plus values-clarification training (Part 2).* The training portion of this study occurred in Part 2. Participants in the VC1 and VC2 groups received training on how to effectively clarify their academic values. There were 10 questions that corresponded with information derived from the values literature that was provided via audio clips and text (participants from these two groups also answered the eight questions relevant to the goal-setting literature from below for a total of 18 questions). The percentage of questions answered correctly was assessed to determine if there was a correlation between the participant's performance during training and their end-of-semester and cumulative GPAs.

*Academic goal-setting training (Part 2).* All participants (from the GS, VC1, and VC2 groups) received training on how to effectively set challenging, academic goals.

There were eight questions that corresponded with the information from the goal-setting literature that was provided via audio clips and text. Performance during training was correlated with the participant's end-of-semester and cumulative GPAs.

*Integrity of the independent variable.* The training modules developed in this study were intended to promote improved academic performance and increase retention rates (or decrease attrition). In terms of participant utilization of the training modules, it should be noted that participants in the three experimental groups completed approximately 97% of all questions from beginning to end. That is, of the total possible 4008 multiple choice and short answer questions across 132 participants, 3907 were responded to. Of note, all multiple choice questions were answered. The only questions unanswered were the short answer options. At the group level, the utilization for the GS Group (N=48) was 98% (20 questions unanswered), for the VC1 Group (N=51), the utilization was (98%; 43 questions unanswered), and 97% (38 questions unanswered) for the VC2 Group.

*Assessment batteries (pre and post).* The *Depression Anxiety and Stress Scale (DASS 21)*; Lovibond & Lovibond, 1995; Appendix H) is a shortened version of the original 42 item version (consisting of 21 items) and takes approximately 5-10 minutes to complete. *DASS 21* is used to measure general anxiety, depression, and stress in many adult populations (including student populations). The original *DASS* gives somewhat more reliable scores, and more information about specific symptoms, but the *DASS 21* has the advantage of taking only half the time to administer. There are several published studies showing that the *DASS 21* has the same factor structure and gives similar results to the full *DASS* (Lovibond & Lovibond, 1995). In general, the full *DASS* is often

preferable for clinical work, and the *DASS 21* is often best for research purposes. The *DASS 21* was delivered in Part 1 to all groups to assess initial levels of general anxiety, depression, and stress. The *DASS 21* was presented a second time (in Part 3) to determine if participation in the *Goal-Setting Training Module* or the *Goal-Setting plus Values-Clarification Training Module* had any effect on (or a change in) initial levels of general anxiety, depression, and stress from Part 1.

The *Quality of Life Scale (QOLS)* (Flanagan, 1978; Burckhardt & Anderson, 2003; Appendix I) consists of 16 questions and takes approximately five minutes to complete. The *QOLS* has low to moderate correlations with physical health status and disease measures. Content validity analysis indicates that the instrument measures domains that diverse groups define as quality of life. The *QOLS* is a valid instrument for measuring quality of life across groups and cultures. The *QOLS* was delivered in Part 1 to all groups to assess initial levels of satisfaction with one's perceived quality of life. The *QOLS* was presented a second time (in Part 3) to determine if participation in the *Goal-Setting Training Module* or the *Goal-Setting plus Values-Clarification Training Module* had any effect on (or a change in) initial levels of satisfaction with one's perceived quality of life from Part 1.

The *Acceptance and Action Questionnaire-2 (AAQ-2)* (Hayes et al., 2004; Appendix J) is a 10 item questionnaire that takes approximately five minutes to complete and measures the construct of experiential avoidance (EA) and has been shown to be a mediator and moderator of intervention effects. The *AAQ-2* is a self report measure that is designed to measure experiential avoidance (the extent to which individuals are willing to experience difficult psychological experiences such as thoughts and feelings), and the

extent to which experiential avoidance is a barrier to effective behavior. The *AAQ-2* utilizes a 7-point Likert scale (1=never true, 7=always true) with lower scores indicating greater acceptance and higher scores indicating greater experiential avoidance. The *AAQ-2* has been found to have satisfactory internal consistency ( $\alpha = .70$ ) and convergent, discriminant, and concurrent validity. Research has demonstrated that more experientially avoidant scores are associated with greater psychological distress (Hayes et al., 2004). Further, the *AAQ-2* has reliably predicted health care utilization and educational performance over the next four years (Hayes et al., 2004). Initial levels of EA have also predicted college GPA and students dropping out. The *AAQ-2* was delivered in Part 1 to all groups to assess initial levels of acceptance and experiential avoidance. The *AAQ-2* was presented a second time (in Part 3) to determine if participation in the *Goal-Setting Training Module* or the *Goal-Setting plus Values-Clarification Training Module* had any effect on (or a change in) initial levels of acceptance and experiential avoidance from Part 1.

The *Personal Values Questionnaire (PVQ)* (Blackledge & Ciarrochi, 2006; Appendix K) consists of nine items and takes approximately five minutes to complete. This measure is used to identify values origin (intrinsic vs. extrinsic), importance, and commitment. The values domains that the *PVQ* addresses are: *Family Relationships*; *Friendships/Social Relationships*; *Couples/Romantic Relationships*; *Education-Schooling/Personal Growth and Development*; *Recreation/Leisure/Sport*; *Spirituality/Religion*; *Community/Citizenship*; and *Health/Physical Well-Being*. For the purpose of this study, we only utilized the *Education- Schooling/Personal Growth and Development* domain. The reasoning for respondents' endorsing a particular value is also

assessed in several important ways by this measure. These are appetitive, avoidant, and pliant reasons. Three questions in the *PVQ* aim to capture a respondent's appetitive (or positively reinforcing reasons for valuing). Respondents are also asked about their reasons for valuing that might be under aversive control in the form of experiential avoidance. They rate to what extent they endorse the statement, "I would feel ashamed, guilty or anxious if I didn't value this". Finally, respondents are asked about their reasons for valuing that might be under the control of a particular form of rule-governance (i.e., pliance). This question aims to get at the extent to which someone is behaving under the aversive control of responding to a rule set by someone in the individual's environment rather than valuing for personally reinforcing reasons. Individuals rate to what extent they endorse the statement, "I value this because somebody else thinks I ought to or because someone else will like it if I do. I probably wouldn't say I value this if I didn't get some kind of praise or approval for it". The abbreviated *PVQ* was delivered during Part 2 to the VC1 and the VC2 groups to identify values origin, importance, and commitment. The *PVQ* was presented a second time (in Part 3) to determine if participation in the *Goal-Setting plus Values-Clarification Training Module* had any effect on (or a change in) values importance and commitment from Part 2.

The *Personal Goals Questionnaire (PGQ)* (Appendix L) was adapted from the abbreviated *PVQ* with a focus on educational goals in lieu of educational values. The *PGQ* consists of nine items and required approximately five minutes to complete. This measure was used to identify academic goals origin (intrinsic vs. extrinsic), goal importance, and goal commitment. This measure also attempts to determine the

appetitive, avoidant, and pliant reasons for setting an academic goal. The *PGQ* was delivered in Part 2 to the GS group to identify the origin, importance, and commitment to the individual's stated academic goal(s). The *PGQ* was presented a second time (in Part 3) to determine if participation in the *Goal-Setting Training Module* had any effect on (or a change in) goal importance and commitment from Part 2.

*Dependent Variables: Primary Measures*

*Student performance and GPA.* Through archival data obtained from the Psychology Department Undergraduate Advisor, we determined if there was a change in the trend of semester and cumulative GPAs for the semesters this study was conducted (i.e., spring and fall 2009). Overall averages were compared within and between the experimental groups and to the comparison group.

*Student retention and withdrawal rates.* Student retention has been defined a number of ways in the literature including freshmen students enrolling in classes for their sophomore year and students staying in school until the completion of their degrees. For the purpose of the current study, student retention was defined as individuals enrolled in classes for the semester following participation in this study for the experimental groups and for the related comparison group. Through admissions data we determined the enrollment and withdrawal rates of all psychology majors in their second year or beyond at the beginning of the spring 2009 semester. We tracked these individuals through the beginning of the spring 2010 semester for between-group analyses.

*Dependent Variables: Secondary Measures*

*Change in responding on assessment batteries (DASS 21, QOLS, AAQ-2, PVQ and PGQ).* We were interested to determine if participation in the academic goal-setting

training or the academic goal-setting plus values-clarification training modules had any impact on how participants responded to the *DASS 21*, *QOLS*, and the *AAQ-2*. Each of the assessments were delivered in Part 1 and again in Part 3 to assess changes in the way participants responded to these questions from pre- to post-assessment. The *PVQ* and *PGQ* are used to identify the origin, importance, and commitment of values and goals, respectively. Each of these assessments were delivered during Part 2 and Part 3 to determine if there was any movement or change in the way participants responded to these questions from pre- to post-assessment.

*Social validity and participant satisfaction.* Wolf (1978) articulated the importance of collecting social validity data. In short, the implication was that no matter how effective our treatments and interventions appear, they will not be accepted, utilized, and maintained by our consumers if they are not satisfied with both the results of treatment and the intervention procedure itself. Accordingly, in Part 3 of the study, all participants were asked questions regarding their participation and satisfaction with the study. We also inquired whether or not participants utilized the *goal-setting calendar/planner* or the *values-clarification calendar* and if they found these instruments beneficial in helping them meet their academic goals or live in accordance with their academic values. Further, follow-up questions were delivered that inquired, “Has participation in this study impacted (positively or negatively) other areas in your life?”; “Has participation in this study helped you achieve (or make progress) toward your goals (or live in accordance with your stated values)?” etc.

### *Data Collection and Analysis*

Data were collected and stored via the training modules (Checkbox<sup>®</sup> 4.5). Data were then exported to Microsoft<sup>®</sup> (MS) Excel and SPSS<sup>®</sup> workbooks for between- and within-group analyses. Between-group analyses were conducted to determine differences between experimental and comparison groups regarding their GPAs and withdrawal rates. In addition, descriptive and correlational analyses were conducted to determine between- and within-group differences on the assessment batteries, demographic differences, year in school, and GPA.

Specifically, descriptive and inferential statistical analyses were conducted on assessment and educational measures. For example, analyses of variance (ANOVAs) and analyses of covariance (ANCOVAs) were conducted on all educational data while descriptive statistics were used to analyze assessment data due to relatively low response rates. In addition, cumulative GPA and related educational data were analyzed using a Mixed Model Repeated Measures (MMRM) approach. A MMRM approach is a sophisticated, elegant, and particularly powerful method to conduct analyses. Unlike standard analyses of variance (ANOVAs), analyses of covariance (ANCOVAs), or repeated measures (RM) models, MMRM models use all available data from all participants. In testing independent variables, mixed regression models take into account the obtained outcome, missingness, and the spacing between the obtained and non-obtained outcomes for participants with missing data. This approach somewhat reduces the analytic problem of missing data (Twohig, et al., manuscript submitted for publication) due to attrition in this study. Effect sizes were calculated as specified by Cohen (1988).

### *Interobserver Agreement (IOA)*

The individual who manages Checkbox<sup>®</sup> 4.5 (from TLTs Instructional Design Team at the University of Nevada, Reno) exported all assessment and training module data and sent it in Microsoft<sup>®</sup> (MS) Excel workbooks to the first author via email attachments. All archival, educational data were obtained from the Psychology Department's Undergraduate Advisor in Microsoft<sup>®</sup> (MS) Excel workbooks. Duplicate copies were coded and sent to a trained undergraduate student for reliability checks. True/False tests were created for all cells in each workbook to identify any disparities. Reliability was calculated by the number of agreements, divided by the number of agreements and disagreements, and multiplied by 100. No disagreements were observed and 100% reliability was obtained. Assessment and educational data were then used for subsequent statistical and graphic analyses. Interobserver agreement checks were conducted by a trained graduate student on 60% of all assessment battery analyses. Agreement checks were conducted by a trained faculty member on over 50% of all educational data analyses.

### Results

The aims of this study were to assess the additive effects of values-clarification training to goal-setting training on the primary measures of (1) student performance and (2) retention rates. The following sections provide an overview of the results in light of our experimental goals.

#### *Aim 1: Student Performance*

Student performance was assessed by measuring changes in cumulative and semester GPA prior to and after receiving training. In conducting the following analyses

we initially examined archival educational data sets and compared changes in GPA across the three experimental groups for the spring 2009 semester (Figure 1). After determining we had statistically equivalent experimental groups on the measure of pre-cumulative GPA (at the beginning of the spring 2009 semester), we pooled the GPAs of the two goal-setting plus values clarification training groups (i.e., VC1 and VC2) into one *condition* to further substantiate the additive effect of values-clarification training relative to goal-setting training alone (i.e., GS group; Figure 2). Additional analyses were conducted to assess changes in GPAs at three different points in time for each of the experimental groups (Figure 3). To provide a further demonstration of the immediate impact that values-clarification training had on student performance, a comparison group (of psychology majors who did not participate in the study) was added to the analysis (Figures 4-14).

Although changes in semester GPA were temporally related to when individuals in the experimental groups participated in this study, cumulative GPA data are more conservative and tend to be the best overall sample of performance because it differentially weights GPAs according to units attempted, which advantages good GPAs with students taking many credits more than “great” GPAs with students enrolled in just a few credits. Accordingly, the following analyses focus on changes in cumulative GPA for the experimental groups to address our primary aim.

As depicted in Figure 1, the immediate impact of the additive component of values-clarification training on the measure of post-cumulative GPA was observed for the VC1 group. A more modest improvement was observed for the GS group while a decrease in the post-cumulative GPA mean for the VC2 (prior to training) was apparent.

Table 2 presents the means and standard deviations in cumulative GPA for each group at pre and post (i.e., the beginning and end of the spring 2009 semester). Initial cumulative GPA means were comparable across the three experimental groups; however, greater cumulative GPA improvements were observed for the GS and VC1 groups relative to the VC2 group where there was a decrease in cumulative GPA. A univariate analysis of variance was conducted to further supplement the graphic depiction and descriptive findings to assess whether there were significant differences between the experimental groups on the measure of post-cumulative GPA. Results indicated that there were significant differences between the experimental groups,  $F(2, 129) = 624.27, p = .000, R^2 = .906$  (Table 3).

An analysis of covariance (ANCOVA) was then conducted to analyze the correlation between the dependent variable (i.e., post-cumulative GPA) and the covariate independent variables (i.e., the demographic variables) which further removed the variability from the dependent variable that can be accounted for by the covariates. Differences in the residual dependent variable as a function of the original independent variables were then tested for significance. As such, the focus of this analysis was to determine differences across experimental groups in terms of post-cumulative GPA after the differential demographic composition of the groups had been taken into account. Specifically, the covariates in relation to changes in cumulative GPAs were analyzed for all groups including demographic characteristics, year in school, number of credits taken, honors status, and if the individual was on the *Millennium Scholarship*. The only covariates related to cumulative GPA at post controlling for pre-cumulative GPA was whether or not the individual was on the *Millennium Scholarship* and next was their age.

The independent variable (training) involved two levels or conditions: goal-setting training alone (GS group) or goal-setting plus values-clarification training (VC1 and VC2 groups). The dependent variable was the post-cumulative GPA mean and the covariates related to changes in GPA at post were the cumulative GPA prior to training (at the beginning of the semester), if the individual was on the *Millennium Scholarship*, and their age. By accounting for the covariates, this analysis demonstrated that the experimental groups were statistically equivalent on the measure of pre-cumulative GPA and statistically different at post. That is, results from the ANCOVA were significant,  $F(4, 127) = 322.604, p = .000, R^2 = .910$  (Table 4) and the assumptions for ANCOVA were met. In particular, the homogeneity of the regression effect was evident for the covariates, and the covariates were linearly related to the dependent measure. In other words, by removing the variability from the dependent variable (accounted for by the covariates), results demonstrated the additive impact of values-clarification training (VC1) relative to the other experimental groups.

Accounting for the covariates, we were able to determine that the adjusted pre-cumulative GPA means for the VC1 group (3.13) and for the VC2 group (3.14) were not significantly different. As such, VC1 and VC2 groups were pooled into a *values plus goal-setting condition* and compared to the *goal-setting alone condition* on the measure of cumulative GPA from pre- to post-training. Adjusting for the previously mentioned demographic factors (e.g., age, gender, and Millennium Scholarship status, etc.), the adjusted cumulative GPA means for the *goal-setting alone condition* (N=48) were:  $M = 3.14$  at pre and  $3.16$  at post while the adjusted means for the *values plus goal-setting condition* (N=84) were  $M = 3.13$  at pre and  $3.23$  at post.

In pooling the GPA data from the two values-clarification training groups, we were able to examine the differences between the two treatment *conditions* (i.e., *goal-setting training condition* and a *values plus goal-setting condition*) at two points in time (i.e., pre and post). As such, an omnibus 2x2 MMRM analysis comparing the two treatment conditions from pre to post was conducted (Table 5). There was a significant effect for post-cumulative GPA,  $F(1, 127.90) = 161.46, p = .000, d = 2.25$ ; a significant effect for *Millennium Scholarship* status,  $F(1, 127.00) = 29.65, p = .000, d = .97$ ; a significant effect for age,  $F(1, 127.00) = 4.94, p = .028, d = .39$ ; and a significant effect from pre to post,  $F(1, 130.00) = 13.56, p = .000, d = .65$ ; however, the interaction between conditions and the change from pre to post was not significant,  $F(1, 130.00) = 3.462, p = .065, d = .33$ . The change in mean scores between conditions from pre to post is shown graphically in Figure 2 and post hoc contrast estimates are presented in Table 6. As shown in Figure 2, the adjusted cumulative GPA mean increased from pre to post across both conditions; however, the angle of the increasing slope was appreciably greater for the *values plus goal-setting condition* than for the *goal-setting alone condition*. However, none of the reported contrast estimates from pre to post across conditions were significant (Table 6). That is, there was not a significant difference on the measure of cumulative GPA between the two conditions at pre ( $M_{diff}$  estimate = -.002, SE = .11,  $t(128.96) = .02, p = .982, 95\% \text{ CI: } -.205, -.209, d = .04$ ). In other words, the baselines across the conditions were not statistically different after adjusting for covariates. In addition, there was not a significant difference between the two conditions at post ( $M_{diff}$  estimate = -.06, SE = .09,  $t(127.254) = -.67, p = .507, 95\% \text{ CI: } -.247, -$

.123,  $d = .12$ ); or from pre to post ( $M_{diff}$  estimate = .064, SE = .04,  $t(130.00) = 1.861$ ,  $p = .065$ , 95% CI: -.004, .133,  $d = .33$ ; Table 6).

However, the present experimental design further allowed for the provision of analyzing changes in GPAs at three different points in time for each experimental group prior to (spring 2009 for the VC2 group) and a semester after participation (fall 2009; for the GS and VC1 groups). As such, the following were treated as categorical factors and are as follows: (1) beginning of spring 2009 (pre/baseline), end of spring 2009 (post), and end of fall 2009 (follow-up). However, attrition from students who dropped out of school or graduated presented an analytical problem when three time periods were examined at once. To address this issue, an omnibus 3x3 (i.e., three groups x three time periods) MMRM analysis was used that treated time as a categorical factor in which the mixed model accounted for attrition and allowed cumulative GPA data from the spring and fall 2009 semesters to be analyzed together.

Table 7 presents the results from the omnibus 3x3 MMRM analysis. There was a significant effect for cumulative GPA,  $F(1, 125.28) = 151.27$ ,  $p = .000$ ,  $d = 2.20$ ; a significant effect for *Millennium Scholarship* status,  $F(1, 126.33) = 28.95$ ,  $p = .000$ ,  $d = .96$ ; a significant effect for age,  $F(1, 125.68) = 5.535$ ,  $p = .02$ ,  $d = .42$ ; and a significant interaction between condition and time,  $F(4, 122.66) = 4.50$ ,  $p = .002$ ,  $d = .38$ . The interaction is shown graphically in Figure 3 and post hoc contrast estimates are presented in Table 7. The interaction can be explained because the pre- to post-cumulative GPA improvement in the VC1 group was significantly greater than that of the GS group ( $M_{diff}$  estimate = -.07, SE = .03,  $t(129.00) = 2.05$ ,  $p = .043$ , 95% CI: .002, .138,  $d = .42$ ) while the GS group did not differ significantly from the VC2 group (prior to training) from pre

to post ( $M_{diff}$  estimate =  $-.04$ ,  $SE = .04$ ,  $t(129.00) = -.98$ ,  $p = .328$ , 95% CI:  $-.114, -.038$ ,  $d = .22$ ; Table 8). The interaction was also explained by the post to follow-up changes in which only the VC2 group improved in relation to the other two experimental groups (i.e., the GS and VC1 group) and significantly more than the VC1 group ( $M_{diff}$  estimate =  $.13$ ,  $SE = .05$ ,  $t(115.46) = 2.92$ ,  $p = .004$ , 95% CI:  $.043, .225$ ,  $d = .43$ ; Table 6). From post to follow-up however, VC1 group trended in a *negative* direction relative to the GS group (Figure 3) as the effect of the values intervention from a semester earlier attenuated ( $M_{diff}$  estimate =  $.08$ ,  $SE = .05$ ,  $t(114.701) = 1.75$ ,  $p = .083$ , 95% CI:  $-.010, .168$ ,  $d = .40$ ; Table 8). This suggests that the positive effect of values-clarification training on the VC1 group's academic performance was not maintained over time. Taken together though, results from the VC1 and VC2 groups demonstrate the additive effect of values-clarification training on student performance relative to the GS group (although these effects may not be permanently maintained).

Visual depiction of the previous analysis illustrating the immediate impact of values-clarification training relative to goal-setting training alone is presented in Figure 3. As demonstrated in Figure 3, the slope, trend, and direction of the GS group slightly increased from pre to post but stabilized at follow-up (Figure 3). Conversely, only the VC1 group's mean moved significantly relative to the GS group from pre to post while the slope for the VC2 group decreased for the same time period (prior to participation). In addition, only the VC2 group's mean increased relative to the GS and VC1 groups from post to follow-up (or more precisely, *pre to post* for the VC2 group; fall 2009) while the slope and the direction of the VC1 group declined at follow-up (Figure 3). It should be noted that although the mean, cumulative GPA for the VC1 group decreased in the fall

2009 semester, the adjusted mean for this group was still greater than at pre (or baseline). The increasing slopes of the VC1 and VC2 groups demonstrate the effectiveness of goal-setting *plus* values-clarification training on cumulative GPAs after training, relative to the GS group. Overall, results validate the additive effect of values-clarification training to goal-setting training preparations. Further, results demonstrate that goal-setting training alone did not significantly improve mean cumulative GPAs from pre through follow-up.

*Comparison across experimental and comparison groups.* In the preceding analyses, differences between the experimental groups on the measure of cumulative GPA were compared. In the following, a comparison group was added to supplement the previous findings. For instance, Figure 4 presents pre- (prior to the semester individuals participated in this study/baseline) and post- (end of semester) cumulative GPAs for each of the experimental and comparison groups. Visual inspection of Figure 4 illustrates that the mean pre-cumulative GPA data was relatively undifferentiated ( $M = 3.07$ ,  $SD = .601$ ) and means and standard deviations across the experimental and comparison groups are shown in Table 9.

Greater cumulative GPA improvements were observed for the VC1 and VC2 groups relative to the GS and comparison groups where there was little improvement. The relative change in cumulative GPA for each of the groups is depicted in Figure 5. The VC1 and VC2 groups demonstrated the largest relative improvement ( $M = 0.10$ ,  $SD = 0.212$ ) in cumulative GPA from pre- to post-training; however, there was actually a decrease in cumulative GPA for the VC2 group in the spring 2009 semester (prior to training). Statistical analyses were conducted to further supplement the previous descriptive findings to assess whether there were significant differences between the

experimental and comparison groups on the measure of post-cumulative GPA. Results from a univariate ANOVA indicated that there were significant differences between experimental and comparison groups,  $F(3, 575) = 1692.91, p = .001, R^2 = .898$  (Table 10).

As with the previous analysis, the VC1 and VC2 groups were combined into a goal-setting plus values clarification *condition* and data from the comparison groups were combined into a *comparison condition* (note that the pre-cumulative GPA scores were not significantly different either across the five groups or the three conditions. As such, the VC1 and VC2 groups were merged into the *goal-setting plus values-clarification training condition* and both comparison groups were combined). Figure 6 depicts the mean changes in cumulative GPA for individuals in the goal-setting training *condition*, the goal-setting plus values-clarification training *condition*, and for the comparison group from pre to post. Increasing slopes across each of the three conditions is observed in Figure 6. However, the angle of the slope at post for the goal-setting plus values-clarification training condition was much steeper than for the goal-setting alone condition and for the comparison condition. In short, when compared to the comparison condition, our findings demonstrate a higher level of positive impact (on cumulative GPA) associated with goal-setting plus values clarification training than that of goal-setting training alone.

While visual inspection of the cumulative GPA data demonstrated between-group differences; an analysis of covariance (ANCOVA) was conducted to further supplement the graphic and descriptive results. The covariates in relation to changes in cumulative GPAs were the same as those from the analysis of only the experimental groups from

above. Specifically, the covariates related to cumulative GPA at post controlling for pre-cumulative GPA across the experimental and comparison groups was whether or not the individual was on the *Millennium Scholarship* and next was their age. The homogeneity of the regression effect was evident for the covariates, and the covariates were linearly related to the dependent measure. Results from the ANCOVA were significant,  $F(5, 573) = 1035.874, p = .000, R^2 = .900$  (Table 11). Again, the goal-setting plus values-clarification training groups (VC1 and VC2,  $N = 84$ ) had the largest adjusted mean ( $M = 3.14$ ), the GS group ( $N = 48$ ) had a smaller adjusted mean ( $M = 3.11$ ), and the comparison group ( $N = 447$ ) had the smallest adjusted mean ( $M = 3.08$ ) on the measure of cumulative GPA at post.

To account for the addition of the comparison group in our analysis, an additional omnibus 4x3 (four groups x three time periods) MMRM analysis was conducted that treated time as a categorical factor in which the mixed model accounted for attrition across all groups and allowed cumulative GPA data from the spring and fall 2009 semesters to be analyzed together. Adjusting for universally available demographic factors (e.g., age, gender, and Millennium Scholarship status, etc.), there were no differences between the pre-cumulative GPAs for or any of the three experimental groups as compared to the comparison condition (i.e., all pairwise comparisons were  $p > .84$ ). Specifically, the adjusted cumulative GPA means for the GS group were:  $M = 3.08$  (pre), 3.12 (post) and 3.12 (follow-up);  $M = 3.08$  (pre), 3.19 (post), and 3.14 (follow-up) for the VC1 group;  $M = 3.10$  (pre), 3.09 (post), and 3.18 (follow-up) for the VC2 group; and  $M = 3.08$  (pre), 3.11 (post), and 3.12 (follow-up) for the comparison group.

Table 12 presents the results from the omnibus 4x3 MMRM analysis. There was a significant effect for cumulative GPA,  $F(1, 396.80) = 507.66, p = .000$ , a significant effect for *Millennium Scholarship* status,  $F(1, 400.73) = 80.92, p = .000$ , a significant effect for age,  $F(1, 395.08) = 20.88, p = .000$ , and a significant interaction between condition and time,  $F(6, 267.18) = 3.35, p = .003$ . The interaction is shown graphically in Figure 7 and post hoc contrast estimates are presented in Table 13. The interaction occurred because the pre- to post-cumulative GPA improvement in the VC1 group was significantly greater than the VC2 group ( $M_{diff}$  estimate =  $-.11, SE = .04, t(414.003) = -2.47, p = .014, 95\% CI: -.19, -.02, d = .64$ ) and significantly greater than the control condition ( $M_{diff}$  estimate =  $-.07, SE = .03, t(414.003) = -2.52, p = .012, 95\% CI: -.13, -.02, d = .46$ ), while the GS group did not differ significantly from either the VC2 or control conditions (in comparison to VC2:  $M_{diff}$  estimate =  $-.04, SE = .04, t(414.003) = -.86, p = .39, 95\% CI: -.13, -.05, d = .19$ ; in comparison to control condition:  $M_{diff}$  estimate =  $-.005, SE = .03, t(414.003) = -.153, p = .88, 95\% CI: -.06, -.06, d = .02$ ; Table 13). The interaction was also explained by the post to follow-up changes in which only the VC2 group improved significantly more than the control condition ( $M_{diff}$  estimate =  $-.07, SE = .03, t(414.003) = -2.23, p = .03, 95\% CI: -.14, -.01, d = .43$ ; Table 13). There was also a trend toward the original VC1 group now differing in a *negative* way relative to the control condition as the effect of the values intervention from a semester earlier declined ( $M_{diff}$  estimate =  $.06, SE = .03, t(414.003) = 1.94, p = .053, 95\% CI: -.0009, -.12, d = .34$ ; Table 13). In addition, the post to follow-up changes in the original GS group once again did not differ from the control condition:  $M_{diff}$  estimate =  $.005, SE = .03, t(414.003) = .157, p = .88, 95\% CI: -.05, -.06, d = .03$ ; Table 13). As a whole,

results demonstrate the immediate impact of values-clarification training on student performance and that goal-setting training alone was not significantly different from the comparison condition.

As shown in Figure 7, the slope, trend, and direction of the GS group closely paralleled that of the comparison group from pre through follow-up. Only the VC1 group's mean moved relative to the comparison group from pre to post while the slope for the VC2 group decreased for the same time period (prior to participation). In addition, only the VC2 group's mean increased relative to the comparison group from post to follow-up while the slope and the direction of the VC1 group declined at follow-up. Overall, the increasing slopes in Figure 7 demonstrate the effectiveness of goal-setting plus values-clarification training on cumulative GPAs after training, relative to the GS group and the comparison group. Moreover, results validate the additive effect of values-clarification training to goal-setting training preparations. Further, results suggest that cumulative GPA for goal setting training alone was not significantly different than the cumulative GPA for the comparison group.

Additional descriptive analyses were conducted to determine the percentage of individuals in each group falling into certain GPA ranges (i.e., less than 0.99, 1.0-1.99, 2.0-2.99, and 3.0-4.0) from pre- to post-training on the measure of cumulative GPA. Figure 8 shows the overall change while Figure 9 illustrates the relative movement in cumulative GPA ranges for each group. For the GS group, 4% (n = 2) of participants' GPAs moved from the 1-1.99 range into the 2-2.99 range while another 2% (n = 1) of individuals' GPAs from this group regressed from the 3.0-4.0 range into the 2-2.99 range (6%, n = 6) as well. For the comparison group, 2% of individuals' GPAs from the spring

2009 comparison group ( $n = 7$ ) moved from the 1-1.99 (1%,  $n = 4$ ) and 2-2.99 (1%,  $n = 3$ ) ranges into the 3.0-4.0 range while 2% ( $n = 3$ ) of individuals' GPAs from the fall 2009 comparison group moved from the 3.0-4.0 range into the 2-2.99 range (1%,  $n = 2$ ) and into the 1-1.99 range (1%,  $n = 1$ ). The most salient improvements in cumulative GPAs were observed for the VC1 and VC2 groups. For example, 8% ( $n = 4$ ) of participants' GPAs from the VC1 group shifted out of the 1-1.99 range (4%,  $n = 2$ ) and the 2-2.99 range (4%,  $n = 2$ ) into the 3.0-4.0 range. Comparable results were found for the VC2 group of which 6% ( $n = 2$ ) of participants' GPAs transferred out of the 2-2.99 range into the 3.0-4.0 range for cumulative GPA (Figure 9).

*Student performance and semester GPAs for CV1, CV2 and Comparison.* Figure 10 depicts pre- and post-semester GPAs for each of the groups. Inspection of the data revealed that the mean pre-semester GPA data were relatively undifferentiated ( $M = 3.18$ ,  $SD = 0.729$ ) across the experimental and comparison groups. The mean changes in semester GPA for each group are presented in Table 14. On average, semester GPAs improved across each of the experimental groups and for the spring 2009 comparison group. Alternatively, mean semester GPAs dropped substantially for the fall 2009 comparison group at the end of the fall 2009 semester. Figure 11 demonstrates the relative change in semester GPA for each of the groups. Of interest, the VC1 and VC2 groups demonstrated the largest relative improvement ( $M = 0.17$ ,  $SD = 0.594$ ) in semester GPA from pre- to post- participation. A univariate analysis of variance was conducted to assess whether there were significant differences between the groups on the measure of post-semester GPA controlling for pre-semester GPA. Results indicated that

there were significant differences between experimental and comparison groups,  $F(3, 575) = 220.61, p = .000, R^2 = .535$  (Table 15).

Collapsing the VC1 and VC2 groups as well as the comparison groups, Figure 12 illustrates the change in semester GPA for individuals in the goal-setting training condition ( $N = 48$ ), the goal-setting plus values-clarification training condition ( $N = 84$ ), and for the comparison group ( $N = 447$ ) for pre- and post-semester GPA. The pre-semester GPA scores were not significantly different either across the five groups or the three conditions. The increasing slopes in Figure 12 again demonstrate the effectiveness of both goal-setting training alone and goal-setting plus values-clarification training on semester GPAs at post, relative to the comparison group. While participants in both experimental conditions showed significant improvement in their semester GPA relative to the comparison group, the slope of the improvement for the goal-setting plus values-clarification training condition was steeper than that of the goal-setting training alone condition.

All previously mentioned covariates in relation to changes in cumulative GPAs were analyzed for changes in semester GPAs across groups. The only covariates related to semester GPA at post were participant age and whether or not the individual was on the *Millennium Scholarship*. An analysis of covariance (ANCOVA) was conducted and the assumptions were met. Results from the ANCOVA were significant,  $F(5, 573) = 137.53, p = .000, R^2 = .545$  (Table 16). The goal-setting plus values-clarification training groups (VC1 and VC2,  $N = 84$ ) had the largest adjusted mean ( $M = 3.32$ ), the GS group ( $N = 48$ ) had a smaller adjusted mean ( $M = 3.31$ ), and the comparison group ( $N = 447$ ) had the smallest adjusted mean ( $M = 3.18$ ) on the measure of semester GPA at post.

Additional descriptive analyses were conducted to determine the percentage of individuals in each group falling into given GPA ranges (i.e., less than 0.99, 1.0-1.99, 2.0-2.99, and 3.0-4.0) from pre- to post-semester GPA (Figure 13). As demonstrated in Figure 13, there was slight movement from the lower GPA ranges into the 3.0-4.0 range for the VC1 and VC2 experimental groups and for the spring 2009 comparison group. However, there was a decrease in the percentage of individuals in this GPA range for the GS group and fall 2009 comparison group. Figure 14 further depicts the relative change in the percentage of students within each GPA range. For the GS group, 11% (n = 5) of participants' GPAs moved from the <.99 (n=1) and 1-1.99 ranges (n = 4) into the 2-2.99 range. However, 2% (n = 1) of the individuals' GPAs declined from the 3.0-4.0 range into the 2-2.99 range. Comparable changes were observed between the VC1 group and the spring 2009 comparison group in which there was a 2% (n = 1) change in participants' GPA from the VC1 group moving out of the 1-1.99 range and 2% (n = 1) moving into the 3.0-4.0 range. Overall, 4% of individuals' GPAs in the spring 2009 comparison group moved out of the 1-1.99 (n = 7) and 2-2.99 range (n = 5) into the 3.0-4.0 range (n = 12). This is contrasted with the VC2 group of which 12% (n = 4) of participants' GPAs shifting out of the 1-1.99 range, and 9% (n = 3) improved into the 2-2.99 range, with the remaining 3% (n = 1) moving into the 3.0-4.0 GPA range. The fall 2009 comparison group experienced the most detrimental change in the direction of individuals' GPAs moving into different GPA ranges. For instance, there was a 2% (n = 3) increase in individuals' GPAs in the <.99 range, a 6% (n = 10) increase in the 1-1.99 range, a 1% (n = 1) increase in the 2-2.99 range, and 9% (n = 14) decrease in the 3.0-4.0 range.

*Aim 2: Student Retention, Withdrawal, and Graduation Rates*

To address our secondary aim, we analyzed the retention, withdrawal, and graduation rates within and between the experimental groups as well as for the comparison group. Table 17 presents student retention, withdrawal, graduation, and follow-up data for each of the experimental groups and for the comparison group. It should be noted that all participants (from the GS, VC1, and VC2 groups) completed the semester they participated in the study (i.e., spring 2009 for the GS and VC1 groups and fall 2009 for the VC2 group). In contrast, 18% ( $n = 51$ ) of individuals in the comparison group did not complete the spring 2009 semester and 12% ( $n = 19$ ) of individuals from the comparison group did not complete the fall 2009 semester. In addition, all participants (that did not graduate in the spring 2009 semester) from the GS and VC1 groups ( $n = 91$ ) re-enrolled in the fall 2009 semester. Alternatively, 1% ( $n = 4$ ) of individuals from the comparison group did not re-enroll in classes for the fall 2009 semester. However, approximately 4% ( $n = 2$ ) of experimental participants from the GS group and 10% ( $n = 5$ ) from the VC1 group did not complete the semester following their participation (i.e., fall 2009; it should be noted that this information will not be available for the VC2 group until the end of the spring 2010 semester and cannot be presented here).

At the end of the spring 2009 semester, 4% ( $n = 2$ ) of participants from the GS group and 12% ( $n = 6$ ) of participants from the VC1 groups graduated. This is contrasted with 24% ( $n = 70$ ) of individuals in the comparison group that graduated at the end of the spring 2009 semester. Fifteen percent ( $n = 5$ ) of participants from the VC2 group and

35% (n = 57) of individuals in the comparison group graduated at the end of the fall 2009 semester (Table 17).

Follow-up enrollment data (associated with students who did not graduate or drop out during the spring or fall 2009 semesters) were analyzed to determine re-enrollment rates for the spring 2010 semester. Ninety-four percent (n = 31) of participants from the GS group, 97% (n = 33) of participants from the VC1 group, and 96% (n = 27) of participants from the VC2 group re-enrolled in classes for the spring 2010 semester. This is in contrast to the comparison group of which 81% (n = 69) of individuals re-enrolled in classes for the spring 2010 semester (Table 17).

#### *Secondary Dependent Measures*

*Change in responding on assessment batteries.* Of the 132 participants from the three experimental groups, only 48 individuals (36%) completed the *DASS 21*, *QOLS*, and the *AAQ-2* at pre (in Part 1) and post (or follow-up; in Part 3). Accordingly, descriptive analyses are provided in terms of observed between- and within-group changes in mean scores of interest. For the *DASS 21*, aggregate scores can range from 21 to 84 indicating low to high levels of relative distress, respectively. For all three groups (N = 48), the mean score at pre was 35.13 (SD = 11.797) and 33.90 at post (SD = 10.372) representing a modest decrease in overall levels of distress after receiving training (Table 18). At the individual group level, the mean score for the GS group (n = 16) at pre was 34.94 (SD = 12.657) and 34.00 (SD = 11.883) at post. For the VC1 group (n = 14), the mean score on the *DASS 21* dropped from 37.29 (SD = 12.658) at pre to 32.00 (SD = 6.587) at post. Alternatively, a different pattern emerged for the VC2 group (n = 18) in which the mean score at pre was 33.61 (SD = 10.705) and 35.28 (SD = 11.605) at

post indicating a modest increase in distress for the group overall (Table 18). Of interest, the VC2 group responded to the *DASS 21* at pre during the beginning of the spring 2009 semester and at post during the end of the fall 2009 semester in which unaccounted-for, extraneous variables may have influenced how participants responded at post.

The *QOLS* measures reported levels of satisfaction with one's life with summed scores ranging from 16 to 112 indicating low to high satisfaction, respectively. The overall mean score for the *QOLS* for all three groups ( $N = 48$ ) at pre was 79.46 ( $SD = 15.799$ ) and 79.25 at post ( $SD = 15.469$ ) representing a relatively undifferentiated change in reported levels of life-satisfaction after training (Table 19). However, there were between-group differences in the mean change in score on the *QOLS* from pre to post. The GS group ( $n = 16$ ) was the only group that reported increases in overall satisfaction on this measure ( $M = 77.94$ ,  $SD = 16.498$  at pre;  $M = 81.38$ ,  $SD = 14.236$  at post) whereas both groups that received goal-setting plus values-clarification training demonstrated a decrease in relative satisfaction. For example, the VC1 group's ( $n = 14$ ) mean pre-score was 77.71 ( $SD = 14.041$ ) and 74.07 ( $SD = 17.925$ ) at post while the VC2 group's ( $n = 18$ ) mean pre-score was 82.17 ( $SD = 16.933$ ) and 81.39 ( $SD = 14.349$ ) at post (Table 19).

The *AAQ-2* measures relative levels of experiential avoidance (EA) and acceptance. Summed scores on the *AAQ-2* range from 10 to 70 with lower scores indicating higher experiential avoidance and higher scores signifying greater acceptance. Across the three groups ( $N = 48$ ), the overall mean score increased from pre- to post-assessment ( $M = 50.19$ ,  $SD = 12.247$  at pre;  $M = 53.02$ ,  $SD = 10.720$ ) suggesting an increase in acceptance after being exposed to training in Part 2 of this study (Table 20).

Mean scores for the GS group ( $n = 16$ ) increased on the *AAQ-2* from pre to post ( $M = 46.06$ ,  $SD = 14.206$  at pre;  $M = 50.63$ ,  $SD = 11.523$ ). A comparable increase was observed for the VC1 group ( $n = 14$ ;  $M = 49.86$ ,  $SD = 11.799$  at pre;  $M = 54.14$ ,  $SD = 10.264$ ) whereas a more modest increase was detected for the VC2 group ( $n = 18$ ;  $M = 54.11$ ,  $SD = 9.887$  at pre;  $M = 54.28$ ,  $SD = 10.576$ ; Table 20).

In contrast to the assessment batteries from above (where items can be summed to provide an overall score), the individual items in the *PVQ* and *PGQ* are analyzed separately to identify the appetitive, avoidant, and pliant “reasons” for the respondent’s stated academic value or goal, respectively. Twenty individuals from the GS group (42%) responded to the *PGQ* at pre (Part 2) and at post (Part 3). Sixteen individuals from the VC1 group (31%) and 19 respondents from the VC2 group (58%) completed the *PVQ* at pre and at post. Pearson correlational analyses were conducted for each item (on the *PVQ* and *PGQ*) with semester and cumulative GPAs. Of all items analyzed, only one question pertaining to experiential avoidant reasoning on the *PVQ* (“I value this because I would feel ashamed, guilty, or anxious if I didn’t”) was correlated with the measure of cumulative GPA ( $r = .398$ ,  $p = .017$ ). A follow-up paired sample T-test indicated that this correlation was not significant,  $t(1, 34) = 1.819$ ,  $p = .079$ . Nonetheless, when these and the results from the cumulative GPA analyses are taken together, there may be some evidence suggesting that those in the VC1 and VC2 groups may have had less experientially avoidant (EA) reasons for choosing their educational values and improved their GPA’s significantly over that of the GS and the comparison group. However, the scoring for the *PVQ* is still under development and therefore is subject to interpretation (Plum, unpublished pre-doctoral project).

*Social validity and participant satisfaction.* Five social validity and follow-up questions (Appendix O) were programmed into Part 3 of this study and delivered to all participants in each group (note: an additional question was offered to the VC1 and VC2 groups to assess whether the participant found goal-setting or values-clarification training more useful). Of the 132 participants from each of the three experimental groups, only 42% (n=56) responded to the social validity and follow-up questions. None of the respondents indicated dissatisfaction and 79% (n = 44) were either “satisfied” (64.3%, n = 36) or “extremely satisfied” (14.3%, n = 8) with their participation in this study. Twenty-one percent of respondents (n = 12) were “moderately satisfied”. Of interest, some between-group differences in relative levels of satisfaction were observed. For instance, 20% (n = 4) of participants from the GS group (N = 20) were “extremely satisfied” with their participation whereas 11.1% (n = 4) of respondents from the VC1 and VC2 groups combined (N = 36) indicated extreme satisfaction with this study.

In addition, across all groups only 32.1% (n = 18) of participants reported that they utilized either the goal-setting or values clarification calendars/planners. However, 83.3% (n = 15) of these individuals indicated that they found the calendars to be useful in helping them achieve their goal(s) or in helping them live in service of their academic value(s). Another question inquired whether or not “participation in this study impacted (positively or negatively) other areas of their life,” of which 42.9% (n = 24) responded in the affirmative. Interestingly, only 50% (n = 28) of respondents reported that participation in this study helped them either achieve (or make progress toward) their academic goal(s) or helped them live in service with their stated academic value(s). Again, some between-group differences were revealed. Specifically, 60% (n = 12) of

participants from the GS group and 44.4% (n = 16) from the VC1 and VC2 groups indicated that their participation either helped them achieve (or make progress toward) their academic goal(s) or helped them live in service with their stated academic value(s), respectively.

The final question asked of the groups that received goal-setting plus values-clarification training (i.e., the VC1 and VC2 groups; N = 36), inquired into which component they found more useful. Fourteen percent (n = 5) of respondents indicated that values-clarification training was more effective, whereas 22.2% (n = 8) reported goal-setting training was more helpful; 27.8% (n = 10) replied that both were equally useful, and 36.1% (n = 13) did not remember.

### Discussion

The purpose of this study was to assess the additive effects of values clarification training to an online goal-setting training procedure on (1) measures of academic performance and (2) student retention. The primary aims of this study were met and the results of the current investigation are encouraging. That is, participation in goal-setting training alone and the additive module of goal-setting plus values-clarification training yielded improved semester and cumulative GPAs, overall. However, participants exposed to the additive component of values-clarification training experienced significantly improved semester and cumulative GPAs in relation to those that received goal-setting training alone and those in the comparison group. Furthermore, all participants that responded to the survey reported satisfaction with the implemented procedures. Moreover, results of this study contribute to the literature by demonstrating the additive effect of values-clarification training to goal-setting procedures.

Additionally, results obtained from the comparison group (i.e., students who did not participate) support previous literature by suggesting that students who are in the greatest need of additional assistance (based upon the obtained GPA data herein) are in fact the least likely to see additional assistance (e.g., Karanbenick & Knapp, 1988). Furthermore, the current investigation contributes to the literature by using GPA as a primary measure which has predominantly been neglected in the retention literature (see Bowen, Price, Lloyd, & Thomas, 2005; Thomas, 2002; Tinto, 1975, 1982).

Of relevance to the current investigation, Sheldon (2002) discussed the importance of choosing goals that accurately reflect a person's values and needs. In addition, Sheldon and Kasser (1998) linked goal attainment to personal well-being (both in the short and long-term) and established that goal attainment is attenuated by the amount to which goals were linked to individual needs and personal values (Sheldon & Kasser, 1998). Moreover, Elliot and Sheldon (1997) found that students who demonstrated a strong fear of and motivation to avoid failure (e.g., pursued goals of academic achievement driven by avoiding these fears), reported less subjective well-being over the semester, less personal control, less self-esteem, and less life satisfaction as compared to those who did not endorse avoidant goals. Further, the authors found that participants with a greater number of avoidance goals reported that the pursuit of those goals was less fulfilling or satisfying (Elliot & Sheldon, 1997). To address these issues, the current study introduced an efficacious method to teach participants how to set goals that were consistent with their academic values which yielded significantly improved GPAs and of which participants reported high levels of satisfaction with the procedures implemented.

However, limitations of the study need to be addressed. For instance, the 3x3 and 4x3 MMRM analyses revealed that cumulative GPAs for the VC1 group attenuated the semester after their participation. This indicates that the effects of the additive component of values-clarification training were not permanent. It should be noted however that a possible contributing factor to this decrease was attrition from the group of individuals who graduated in the spring (with higher overall GPAs, elevating the mean of the group). It should also be reiterated that even though the mean, cumulative GPA decreased for this group at follow-up, the mean, cumulative GPA was .06 greater at the end of the fall 2009 semester (i.e.,  $M = 3.14$ ) than prior to their participation at the beginning of the spring 2009 semester ( $M = 3.08$ ). Results from the VC1 group and the VC2 group (when taken together) demonstrated that the additive component of values-clarification training has the capacity to move a whole semester's worth of performance.

Another limitation of this study is that due to its applied nature, this investigation did not offer a process account nor did it allow for the assessment and determination of the function of goal setting or values clarification. Nor did this investigation clarify the ambiguity and disparity in the behavioral literature regarding the function of goals (i.e., SDs, EOs/MOs, consequences, etc.). Likewise, while the additive effects of values-clarification training to goal-setting training (with respect to both semester and cumulative GPA) were observed, it is not clear that this study addressed the theoretical question regarding the distinction between goals and values.

Additionally, although all participants in the experimental groups completed the semester they participated in this study; a number of individuals enrolled but did not complete the subsequent semester (i.e., fall 2009). While a greater percentage of

individuals in the comparison group dropped out (12%,  $n = 19$ ) the following semester relative to their counterparts in the experimental groups (8%,  $n = 7$ ), the current procedure did not account for competing contingencies (e.g., economic concerns, work and family constraints, etc.) that led to student withdrawals and attrition or address the reasons why.

Furthermore, tentative conclusions regarding the utility of programming media into the training modules should be made. For example, a probe question was programmed into the training modules for the VC1 and VC2 groups that asked if the participant wished to continue with the media portion of the module (for the *Tending a Garden* metaphor) or if they wanted to continue with text only. Only 32% ( $n = 25$ ) of respondents proceeded to the audio portion for the metaphor. This may be explained in part by anecdotal reports in which several participants interacted with the training modules in public places (i.e., the university library) where the audio was not available (unless the individual had headphones) and/or was, “uncomfortable to play with others around”. Further, of the 56 participants (42%;  $N=132$ ) who responded to the follow-up survey questions, only 18 (32%) utilized the optional goal-setting or values-clarification calendars/planners. Lastly, the relatively small sample size of individuals who completed the pre- and post-assessment batteries provided us with insufficient power to conclusively determine if participation in training had any effect on these measures. However, descriptive analyses demonstrated decreased levels of distress on the *DASS 21*, relatively no change in perceived quality of life on the *QOLS*, and increased acceptance on the *AAQ-2* at the aggregate level across groups after receiving training. Nevertheless, results from the assessment batteries should be interpreted with caution.

To address some of the previously mentioned concerns, future research should attempt to provide a process account and determine the function of goal setting and values clarification through basic and analogue preparations. This type of research may allow for the systematic examination of the theoretically postulated differences between goals and values, attempt to determine the function (or provide a process account) of each, and would be of benefit to the behavioral science literature and community. That is, empirically determining the function of and demonstrating a difference between goal-setting strategies and values-clarification interventions will inform relevant audiences of the more effective intervention to use with college (and other) populations. In the current investigation however, results suggest that the addition of values-clarification to goal-setting training significantly improved GPAs relative to the goal-setting alone (GS) and to the comparison group.

Of interest, the effects of goal-setting training on the measures of semester and cumulative GPA did not replicate previous literature suggesting the robust impact of goal-setting procedures on target measures (e.g., Bandura, 1993; Erez, 1977; Fellner & Sulzer-Azaroff, 1985; Ivancevich, 1982, Komaki et al., 1977; Locke & Latham, 1990; Locke, Shaw, Saari, and Latham, 1981). However, it should be reiterated that the reported results on the effectiveness of goal setting are often confounded with other variables (as part of a treatment package) including feedback on goal progression, incentives, and social reinforcement for goal achievement (Erez, 1977; Ivancevich, 1982; Komaki et al., 1977). Alternatively, the current procedure omitted feedback from the training modules and did not provide consequences for goal achievement in an attempt to examine the effects of goal setting in isolation. As such, the present results support the

contention that in the absence of other strategies, goals should exert control only to the extent that individuals have experienced a history of reinforcement as a consequence of adhering to goals (e.g., Fellner & Sulzer-Azaroff, 1985). Furthermore, in the absence of explicit reinforcement, goal directed behavior may not have been maintained by natural contingences for individuals without a history in which *achievement* has predicted a high level of reinforcement (e.g., the achievement-reinforcement relation; O'Hora & Maglieri, 2006) relative to other sources of reinforcement available (i.e., competing contingencies) for the individual's behavior.

Unfortunately, historical and verbal influences on behavior are virtually impossible to isolate due to group designs. While this study did not provide a process account or determine the function of goal setting or values clarification, it is tenable to assume that participants' interaction with the training module (generation of an action plan to achieve their academic goals) increased the saliency of the process and outcome(s) for the individual. That is, the verbal statements participants generated with respect to their goals may have served as discriminative stimuli (SDs) that occasioned academic, goal-directed behavior and signaled the availability of goal achievement as a reinforcing consequence (Agnew, 1998). Stated another way, when a goal statement reliably accompanies a reinforced response, it acquires discriminative control over that response such that the presence of the goal statement increases the probability of goal-directed behavior. When a particular stimulus (e.g., a goal statement) precedes or accompanies a reinforced response, it may gradually assume controlling properties that occasion the emission of the response. In that regard, goals that have consistently been paired with a reinforced response should occasion that response under similar conditions

(Fellner & Sulzer-Azaroff, 1984). However, in the case of participants in the GS group, it is possible that if goal achievement (or goal progress) was not reinforced in the presence of their goal statement, the goal statement did not acquire discriminative control over their academic behavior.

It is also possible that participants in the GS groups set academic goals that they did not truly value. For example, a psychology major taking a core curriculum class (e.g., Western Traditions) may have set a goal to get an A in that class, but may not have truly valued learning the information provided therein. Further, these individuals may have had avoidant (e.g., fear of failure) or pliant (e.g., told by parents that they must earn an A in all classes) reasons for choosing and setting their goals (which have been linked to poor outcomes; e.g., Elliot & Sheldon, 1997). This may in part explain the robust differences observed between the goal-setting training group and the two groups that received the additive component of values-clarification training. That is, individuals who were exposed to values-clarification training (i.e., the VC1 and VC2 groups) were then prompted to set academic goals that were consistent with their academic values in which they may have had more appetitive reasons for setting their personal goals.

Furthermore, it is posited that the goal statements (generated by participants in the VC1 and VC2 groups) that were *values-consistent* served as verbal establishing stimuli (motivative augmentals; Hayes, Zettle, & Rosenfarb, 1989) which temporarily altered the consequential value of reinforcing events participating in an equivalence class of which goal achievement and/or living in accordance with ones values were part of the individual's history. Hence, it is possible that the goal statements and values statements generated by participants in the current investigation functioned as motivative

augmentals. Motivative augmentals alter the effectiveness of stimuli by altering a consequential function (Hayes et al., 2001; Houmanfar, Rodrigues, & Smith, 2009; Steward et al., 2006). As motivative augmentals, perhaps the academic goal and value statements articulated by participants temporarily increased the reinforcing aspect of engaging in academic behaviors that were personally valued by the individual. For example, a participant that set an academic goal (e.g., “I want to do well in my psychology class so I get into graduate school”) may have increased the frequency and/or duration of their academic behaviors (i.e., studying, reading, etc.). In this case, the reinforcing effectiveness of the stimulus, “I want to do well in my psychology class” (which may have already functioned as a reinforcer) was increased by the statement, “so I get into graduate school”. Alternatively, formative augmentals establish previously neutral stimuli as reinforcers of punishers (Hayes et al., 2001; Houmanfar, Rodrigues, & Smith, 2009; Steward et al., 2006). Thus, values-consistent goal statements may have functioned as formative augmentals for individuals who did not have a history of effective goal setting. For instance, after being exposed to training, an individual who set goals that were congruent with their personal, academic values (e.g., “I want to do well in my psychology class because learning that information is interesting and important to me”) may have prompted that individual to seek regular feedback from their instructor which previously may have served as a neutral stimulus for that individual.

Of further empirical and theoretical interest, a challenge for future research regarding augmentals is distinguishing between verbal establishing stimuli and discriminative stimuli. In this line, Hayes et al. (2001) have contended that a verbal establishing stimulus is similar to an establishing operation (EO) except that it is verbal

behavior and therefore has additional features (i.e., transformation of stimulus function). An establishing operation is, “any change in the environment which alters the effectiveness of some object or event as reinforcement and simultaneously alters the momentary frequency of the behavior that has been followed by that reinforcement” (Michael, 1982, pp. 150-151). Likewise, a motivative augmental temporarily alters the consequential value of reinforcing events. This is contrasted with three defining features of a discriminative stimulus which is a, “stimulus change which 1) given the momentary effectiveness of some particular type of reinforcement 2) increases the frequency of a particular type of response 3) because that stimulus change has been correlated with an increase in the frequency with which that type of response has been followed by that type of reinforcement” (Michael, 1982, p. 149).

An advantage of the concepts of EOs (or motivating operations/MOs), motivative and formative augmentals is that they avoid reference to inferential explanations that are beyond the realm of prediction and influence in that the concepts restrict causal status to environmental factors. Further, these concepts provide a further account of empirical findings that are not parsimoniously accounted for by traditional behavioral principles (e.g., discriminative stimuli and reinforcers). However, Ju (2001) has argued that to establish the difference (vis. between discriminative stimuli and EOs); a functional distinction necessitates an analysis of historical processes. In particular, an understanding of why events might have establishing functions as opposed to discriminative functions implies knowledge of the processes through which events come to have their functions within a given context (Ju, 2001, p. 61). As such, Ju (2001) attempted to provide an empirical account of the *process* through which events,

operations, or conditions acquire establishing functions. Through an analogue preparation, Ju (2001) examined whether nonsense syllables might serve as verbal establishing stimuli that temporarily altered the consequential value of reinforcing events participating in an equivalence class with them. Results suggested that the probability of responding on a free-choice task in the presence of nonsense syllables was greater than in their absence following extended exposure to a continuous reinforcement contingency. Ju (2001) concluded that these momentary increases in responding suggested that the nonsense syllables might have been functioning as verbal establishing stimuli to momentarily alter the consequential functions of pictures (after pictures in the preparation were brought under discriminative control) by the virtue of their participation in an equivalence class with the pictures. In this line, future research may attempt to determine the function or provide a process account of goal setting and values clarification through basic or analogue preparations using a within-subjects design (which is more amenable to an analysis of historical processes) as opposed to the between-group design implemented in this study.

Further, future research should develop a qualitative taxonomy or criterion to categorize the goal and value statements generated by participants in the training modules. For instance, participants in the current study set process goals (e.g., “I will read one hour per night so I get an A on my next exam”) while others set outcome goals (e.g., “I want to be a doctor, make a lot of money, graduate with a 4.0, etc”). In addition, some participants had avoidant goals (e.g., “I don’t want to lose my scholarship”), pliant values (e.g., “I want to make my parents proud”), and appetitive values (e.g., “I enjoy learning new things”). Furthermore, this taxonomy should include an analysis of

participant adherence to the *SMART* goal protocol and its effect on goal accomplishment. Recent work in area of rule taxonomy (e.g., Houmanfar, Rodrigues, & Smith, 2009; Johnson, Houmanfar, Smith, 2010; Pelaez & Moreno, 1998) can be used as a model for the development of goals and values categorization which would contribute to the qualitative account (and perhaps a functional account) of value clarification in relation to goal setting.

In addition, future researchers using similar preparations as those implemented in this study can attempt to account for some of the competing contingencies which may lead to student attrition in institutes of higher education by incorporating survey questions that address this issue. Likewise, future research should add social validity questions regarding the utility of the embedded media in the training modules and program online/automated access to the use of the calendars/planners (e.g., linked to MS Outlook). In the current study, use of the calendars/planners was optional and had a relatively low utilization rate (i.e., 32%).

Despite these limitations, the procedures implemented and results obtained from this study suggest several implications for higher education. Primarily, this was a cost-effective and efficient means to provide training to a sample of the student population at the University of Nevada, Reno (UNR). The use of automated, online training modules has several advantages over face-to-face training or workshops. For instance (given that an individual has access to a computer and the Internet), administrators, teachers, and/or trainers have the capacity and capability to provide individualized training and instruction to masses of individuals in a cost-effective and timely manner. Moreover, the use of automated training modules is beneficial to the researcher in that the instrument collects

and stores all relevant measures which can be exported for subsequent analyses.

Accordingly, it is argued that the procedures and results of this study can be generalized to a larger student population at the UNR (including the College or even as part of new student orientation).

Of further relevance to University administrators is the utility of this type of training to improve GPAs and relative retention rates. Specifically, the immediate impact of training was observed in which semester and cumulative GPAs for the VC1 and VC2 groups improved and retention rates were greater for all experimental groups relative to the comparison group. While cumulative GPAs attenuated one semester following training for the VC1 group, the present results suggest that this type of technology can be used to complement existing and future retention practices at the University.

Further, linking values-clarification training to goal-setting training yielded the most robust effects in the current investigation. Results of this study support the contention that values clarification can change the function of an aversive task (e.g., studying) from something to be avoided to something to approach in the service of a larger life goal or value (Hayes et al., 2004). Many people set goals (or have them imposed by others); however, if pursuit of those goals is not truly valued by the individual, less than optimal results should be expected. Alternatively, when people believe an action will produce a positive outcome and when they value that outcome, they are more likely to behave accordingly (Atkinson, 1964; Vroom, 1964). While “values can never be fully satisfied, permanently achieved, or held like an object” (Hayes, Strosahl, & Wilson, 2003, p. 207), one could argue that participants in this study (who behaviorally committed to their academic values), demonstrated that they could live

in accordance with their stated academic value(s) which may have ultimately led to the overall improved academic performance and retention rates established in this study.

This is a powerful finding for University administrators and faculty who wish to improve local retention rates and student GPAs.

In addition to institutes of higher education, results of this study provide implications for organizational settings. For example, efficient means to provide employee and leadership training are frequently discussed topics in the business management literature (Nelson & Quick, 2006). The current procedure has the agility to be adapted to meet organizational training goals and can be offered in a cost-effective and efficient manner. Additionally, new organizational initiatives or requirements are often met with employee resistance. Aligning goal-setting and values-clarification training with an organization's mission statement, job description, or new initiative has the capacity to promote employee "buy-in". In this line, Herbst and Houmanfar (2009) argued that values-clarification training procedures can help promote psychological flexibility (e.g., Bond et al., 2006) and encourage organizational and individual *value congruence* (Herbst & Houmanfar, 2009, p.59). Finally, many human resource (HR) departments utilize projective, personality, or psychometric testing when it comes to staff selection and placement (Gatewood & Feild, 2001). An interesting area of future research would be to investigate the utility of the assessment batteries implemented in this study (i.e., *DASS 21*, *QOLS*, *AAQ-2*, and particularly the *PVQ* or *PGQ*) as alternatives to other commonly used projective, personality, and psychometric tests.

In conclusion, when students pursue avoidant goals (i.e., educational pursuits that are negatively reinforcing; e.g., "I will work hard because I am afraid of failing"), their

behavior (verbal or overt) can lead to poor physical and psychological health as well as meager academic performance outcomes (Elliot & Sheldon, 1997). Stated another way, when the function of a values-consistent behavior is avoidance or pliance based (e.g., behavior under the aversive control of fear of failure), such patterns of action are often negatively reinforcing in the short-term and are linked to poor outcomes in the long term (Elliot & Sheldon, 1997). This account may provide an understanding of sub-optimal retention rates as well as declining student performance nationally. This also emphasizes the need to provide values-clarification training to college students to help facilitate the process of linking one's academic goals (and behaviorally committing to actions that are consistent) with their academic values, which in turn would be positively reinforcing and ideally promote greater levels of satisfaction, retention, and academic performance. Moreover, this type of training has the potential to benefit the student throughout their college career and can ultimately be generalized to other domains in their professional and personal lives to promote better health, psychological, and performance outcomes.

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## Appendix A

**EMAIL 1 (GS Group)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of a Goal-Setting Training Module on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

You are being asked to participate in a research study.

We are conducting a three-part study to help students develop strategies to achieve their academic goals and improve retention rates at the University of Nevada, Reno.

In order to do so, we are asking all Psychology majors in their second year or beyond (and at least 18 years of age) to answer a few brief questionnaires. The module will take approximately 30 minutes to complete.

Participation is voluntary. You will earn 1 Psychology Experience Credit (PEC) for your participation in Part 1 of this study and to thank you for your time, you will be entered into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

Those who participate in Part 1 of this study will be sent a similar invitation email in March to participate in Part 2 of this study to earn an additional PEC and to receive an additional entry into the drawing.

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of a Goal-Setting Training Module on Student Retention Rates – Part 1”:

<http://unr.sona-systems.com/>

To begin the goal-setting training module now, please follow the link below:

<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix B

**EMAIL 1 (VC1 Group)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

You are being asked to participate in a research study.

We are conducting a three-part study to help students develop strategies to effectively set academic goals and clarify their academic values while improving retention rates at the University of Nevada, Reno.

In order to do so, we are asking all Psychology majors in their second year or beyond (and at least 18 years of age) to answer a few brief questionnaires and participate in a values clarification online training module. The module will take approximately 30 minutes to complete.

Participation is voluntary. You will earn 1 Psychology Experience Credit (PEC) for your participation in Part 1 of this study and to thank you for your time, you will be entered into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

Those who participate in Part 1 of this study will be sent a similar invitation email in March to participate in Part 2 of this study to earn an additional PEC and to receive an additional entry into the drawing.

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates- Part 1”:  
<http://unr.sona-systems.com/>

To begin the values clarification plus goal-setting training module now, please follow the link below:  
<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix C

**EMAIL 1 (VC2 Group)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

You are being asked to participate in a research study.

We are conducting a three-part study to help students develop strategies to effectively set academic goals and clarify their academic values while improving retention rates at the University of Nevada, Reno.

In order to do so, we are asking all Psychology majors in their second year or beyond (and at least 18 years of age) to answer a few brief questionnaires and participate in a values clarification online training module. The module will take approximately 30 minutes to complete.

Participation is voluntary. You will earn 1 Psychology Experience Credit (PEC) for your participation in Part 1 of this study and to thank you for your time, you will be entered into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

Those who participate in Part 1 of this study will be sent a similar invitation email in **September 2009** to participate in Part 2 of this study to earn an additional PEC and to receive an additional entry into the drawing.

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates – Part 1”:  
<http://unr.sona-systems.com/>

To begin the values clarification plus goal-setting training module now, please follow the link below:  
<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix D

**EMAIL 2 (GS Group)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of a Goal-Setting Training Module on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

Thank you for your participation in Part 1 of the study entitled: “An Analysis of the Impact of a Goal-Setting Training Module on Student Retention Rates”. You are being asked to participate in Part 2 of this research study.

We are conducting a three-part study to help students develop strategies to achieve their academic goals and improve retention rates at the University of Nevada, Reno.

Part 2 of this study will consist of participating in an online goal-setting training module and responding to a brief questionnaire. The module will take approximately 30-45 minutes to complete.

Participation is voluntary. You will earn 1 additional Psychology Experience Credit (PEC) for your participation in Part 3 of this study and to thank you for your time, you will receive an additional entry into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of a Goal-Setting Training Module on Student Retention Rates – Part 2”:

<http://unr.sona-systems.com/>

To begin the goal-setting training module now, please follow the link below:

<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix E

**EMAIL 2 (VC1 & VC2 Groups)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

Thank you for your participation in Part 1 of the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates – Part 1”. You are being asked to participate in Part 2 of this research study.

We are conducting a three-part study to help students develop strategies to achieve their academic goals and improve retention rates at the University of Nevada, Reno.

Part 2 of this study will consist of participating in an online goal-setting and values clarification training module and responding to a brief questionnaire. The module will take approximately 30-45 minutes to complete.

Participation is voluntary. You will earn 1 additional Psychology Experience Credit (PEC) for your participation in Part 3 of this study and to thank you for your time, you will receive an additional entry into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates – Part 2”:

<http://unr.sona-systems.com/>

To begin the values clarification plus goal-setting training module now, please follow the link below:

<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix F

**EMAIL 3 (GS Group)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of a Goal-Setting Training Module on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

Thank you for your participation in Part 2 of the study entitled: “An Analysis of the Impact of a Goal-Setting Training Module on Student Retention Rates”. You are being asked to participate in Part 3 of this research study.

We are conducting a three-part study to help students develop strategies to achieve their academic goals and improve retention rates at the University of Nevada, Reno.

Part 3 of this study will consist of answering a few brief questionnaires and responding to a few questions regarding your experiences in this study. The module will take approximately 30 minutes to complete.

Participation is voluntary. You will earn 1 additional Psychology Experience Credit (PEC) for your participation in Part 3 of this study and to thank you for your time, you will receive an additional entry into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of a Goal-Setting Training Module on Student Retention Rates – Part 3”:

<http://unr.sona-systems.com/>

To begin the goal-setting training module now, please follow the link below:

<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix G

**EMAIL 3 (VC1 & VC2 Groups)**  
**Automatically-Generated Email to Participate in a Study Entitled:**  
**An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on**  
**Student Retention Rates**

Email subject heading will state: “Participate in a brief online study for PEC credits and become eligible for a raffle for an i-Pod touch and other prizes.”

Dear student,

Thank you for your participation in Part 2 of the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates – Part 2”. You are being asked to participate in Part 3 of this research study.

We are conducting a three-part study to help students develop strategies to effectively set academic goals and clarify their academic values while improving retention rates at the University of Nevada, Reno.

Part 3 of this study will consist of answering a few brief questionnaires and responding to a few questions regarding your experiences in this study. The module will take approximately 30 minutes to complete.

Participation is voluntary. You will earn 1 additional Psychology Experience Credit (PEC) for your participation in Part 3 of this study and to thank you for your time, you will receive an additional entry into a drawing for gift cards at the ASUN Bookstore, Target, Best Buy, a \$50 gas card, and a grand prize of an i-Pod touch (chance of winning: at least 1 out of 350).

To sign up for credit, please follow the link below and select the study entitled: “An Analysis of the Impact of Goal-Setting and Values-Based Training Modules on Student Retention Rates – Part 3”:  
<http://unr.sona-systems.com/>

To begin the values clarification plus goal-setting training module now, please follow the link below:  
<https://www.cisweb1.unr.edu/survey/login.aspx>

If you are interested in participating and want to learn more, please contact Jared Chase at [jchase@unr.nevada.edu](mailto:jchase@unr.nevada.edu)

Ramona Houmanfar, Ph.D., Psychology Professor  
Jared Chase, M.A., Doctoral Student

## Appendix H

**DASS21**

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

*The rating scale is as follows:*

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

## Appendix I

**QUALITY OF LIFE SCALE (QOLS)**

Please read each item and circle the number that best describes how satisfied you are at this time. Please answer each item even if you do not currently participate in an activity or have a relationship. You can be satisfied or dissatisfied with not doing the activity or having the relationship.

## 1. Material comforts, home, food, conveniences, financial security

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 2. Health - being physically fit and vigorous

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 3. Relationships with parents, siblings &amp; other relatives - communicating, visiting, helping

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 4. Having and rearing children

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 5. Close relationship with spouse or significant other

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 6. Close friends

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 7. Helping and encouraging others, volunteering, giving advice

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 8. Participating in organizations and public affairs

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## 9. Learning- attending school, improving understanding, getting additional knowledge

7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## (QOLS cont.)

10. Understanding yourself – knowing your assets and limitations – knowing what life is about						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
11. Work – job or in home						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
12. Expressing yourself creatively						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
13. Socializing – meeting other people, doing things, parties, etc.						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
14. Reading, listening to music or observing entertainment						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
15. Participating in active recreation						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
16. Independence, doing for yourself						
7	6	5	4	3	2	1
Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible

## Appendix J

**AAQ-2**

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

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Never true</b>	<b>Very seldom true</b>	<b>Seldom true</b>	<b>Sometimes true</b>	<b>Frequently true</b>	<b>Almost always true</b>	<b>Always true</b>

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

## Appendix K

**Personal Values Questionnaire (PVQ)*****Personal Value: Education-Schooling/Personal Growth & Development***

**Instructions:** What kind of student would you be in an ideal world? What kinds of things do you value learning as a person? What qualities do you value bringing to your role as a student, in school or any other places where you learn things you feel are of great importance to you? Some people value learning to face new challenges, learning different perspectives on important issues, learning better or more efficient ways to do specific things, or learning how to grow as a person. Some people value qualities like being open and receptive to new ideas and perspectives, or making serious and careful considerations of important issues. Regardless of what others want, you should write down the kinds of things *you* really value learning—and/or qualities you value demonstrating as a student.

**Please write down your *Education-Schooling Value(s)* here:**

---

**Please answer the following questions by circling the number (on the right) that is true for you:**

1. I value this because somebody else wants me to or thinks I ought to, or because someone else will like it if I do. I probably wouldn't say I value this if I didn't get some kind of praise or approval for it.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
2. I value this because I would feel ashamed, guilty, or anxious if I didn't.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
3. I value this because I view it as important, whether or not others agree. Although this value may have been taught to me by others, now it is my own heartfelt value.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
4. I value this because doing these things makes my life better, more meaningful, and/or more vital.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
5. I value this because I experience fun and enjoyment when I am engaged in the value.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
6. In the last month, I have been this successful in living this value (in acting consistently with this value):	1 0-20% successful	2 21-40% successful	3 41-60% successful	4 61-80% successful	5 81-100% successful
7. I am this committed to living this value (to acting consistently with this value):	1 Not at all committed	2 Slightly committed	3 Moderately committed	4 Quite committed	5 Extremely committed
8. How important is this value to you?	1 Not at all Important	2 Slightly Important	3 Moderately Important	4 Quite Important	5 Extremely Important
9. Right now, would you like to improve your progress on this value?	1 Not at all	2 A little bit	3 Moderately so	4 Quite a bit	5 Very much so

## Appendix L

**Personal Goals Questionnaire (PGQ)*****Personal Goal: Education-Schooling/Personal Growth & Development***

**Instructions:** What kind of student would you be in an ideal world? What kinds of things do you find important learning as a person? What qualities do you find important bringing to your role as a student, in school or any other places where you learn things you feel are of great importance to you? Some people enjoy learning to face new challenges, learning different perspectives on important issues, learning better or more efficient ways to do specific things, or learning how to grow as a person. Some people enjoy qualities like being open and receptive to new ideas and perspectives, or making serious and careful considerations of important issues. Regardless of what others want, you should write down *your academic goal(s)* for learning—and/or qualities you find important demonstrating as a student

**Please write down your *Education-Schooling Goal(s)* here:**

**Please answer the following questions by circling the number (on the right) that is true for you:**

1. This goal is important to me because somebody else wants me to or thinks I ought to, or because someone else will like it if I do. I probably wouldn't say this goal is important to me if I didn't get some kind of praise or approval for it.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
2. This goal is important to me because I would feel ashamed, guilty, or anxious if I didn't make progress toward the goal.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
3. This goal is important to me this because I view it as important, whether or not others agree. Although this goal may have been taught to me by others, now it is my own heartfelt goal.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
4. This goal is important to me because making progress toward this goal makes my life better, more meaningful, and/or more vital.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
5. This goal is important to me because I experience fun and enjoyment when I am engaged in progress toward the goal.	1 Not at all for this reason	2 Mostly not for this reason	3 Unsure of reason	4 Mostly for this reason	5 Entirely for this reason
6. In the last month, I have been this successful in making progress toward this goal (in acting consistently to achieve this goal):	1 0-20% successful	2 21-40% successful	3 41-60% successful	4 61-80% successful	5 81-100% successful
7. I am this committed to making progress toward this goal (in acting consistently to achieve this goal):	1 Not at all committed	2 Slightly committed	3 Moderately committed	4 Quite committed	5 Extremely committed
8. How important is this goal to you?	1 Not at all Important	2 Slightly Important	3 Moderately Important	4 Quite Important	5 Extremely Important
9. Right now, would you like to improve your progress on this goal?	1 Not at all	2 A little bit	3 Moderately so	4 Quite a bit	5 Very much so

Appendix M

Month: \_\_\_\_\_

Academic Goal: \_\_\_\_\_

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday					
Specify Deadlines, Commitments, Goals for each day:																								
Goal Met?	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A
Specify Deadlines, Commitments, Goals for each day:																								
Goal Met?	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A
Specify Deadlines, Commitments, Goals for each day:																								
Goal Met?	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A
Specify Deadlines, Commitments, Goals for each day:																								
Goal Met?	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A
Specify Deadlines, Commitments, Goals for each day:																								
Goal Met?	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A	Y	N	N/A

- 1) Set Deadlines (Quizzes, Exams, Papers, etc.) as well as other events for the month (e.g., extracurricular activities)
- 2) Set Proximal “SMART” goals for each day of the week to achieve your goal (e.g., number of pages you will read; hours/day you will study, etc.)
- 3) Indicate (circle) if you have met your proximal goals for a given day in the space provided (i.e., Y – yes; N – no; N/A – if you have no goals for the day)
- 4) Please note that this is optional and you can print off as many copies of this form as you like.

Appendix N

Month: \_\_\_\_\_

Academic Value: \_\_\_\_\_

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday				
Specify Deadlines or Commitments that may help or hinder your academic values											
In the last week, I have been ___ % successful in acting consistently with this value:							0-20%	21-40%	41-60%	61-80%	81-100%
Specify Deadlines or Commitments that may help or hinder your academic values											
In the last week, I have been ___ % successful in acting consistently with this value:							0-20%	21-40%	41-60%	61-80%	81-100%
Specify Deadlines or Commitments that may help or hinder your academic values											
In the last week, I have been ___ % successful in acting consistently with this value:							0-20%	21-40%	41-60%	61-80%	81-100%
Specify Deadlines or Commitments that may help or hinder your academic values											
In the last week, I have been ___ % successful in acting consistently with this value:							0-20%	21-40%	41-60%	61-80%	81-100%
Specify Deadlines or Commitments that may help or hinder your academic values											
In the last week, I have been ___ % successful in acting consistently with this value:							0-20%	21-40%	41-60%	61-80%	81-100%

- 1) State you academic value at the top of this sheet.
- 2) List any deadlines (Quizzes, Exams, Papers, etc.) as well as other events for the month (e.g., extracurricular activities).
- 3) Indicate (circle) how successful you have been acting consistently with your stated academic value each week.
- 4) Please note that this is optional and you can print off as many copies of this form as you like.

## Appendix O

**Post Intervention Survey**

1. How satisfied are you with your participation in this study?

1	2	3	4	5
Extremely Dissatisfied	Dissatisfied	Moderately	Satisfied	Extremely Satisfied

2a. Did you utilize the Goal-Setting Calendar/Planner from Part 2 of this study? (\*Goal Setting Group Only\*)

1	2
Yes	No

2b. Did you utilize the Values Calendar from Part 2 of this study? (\*Values Clarification Group Only\*)

1	2
Yes	No

3a. Did you find the Goal-Setting Calendar/Planner useful in helping you achieve your goal(s)? (\*Goal Setting Group Only\*)

1	2	3
Yes	No	N/A – I did not use the Goal-Setting Calendar/Planner

3b. Did you find the Values Calendar/Planner useful in helping you live in service of your academic value(s)? (\*Values Clarification Group Only\*)

1	2	3
Yes	No	N/A – I did not use the Values Calendar

4. Has participation in this study impacted (positively or negatively) other areas in your life?

1	2
Yes	No

5a. Has participation in this study helped you achieve (or make progress toward) your academic goal(s)? (\*Goal Setting Group Only\*)

1	2
Yes	No

5b. Has participation in this study helped you live in service with your stated academic value(s)? (\*Values Clarification Group Only\*)

1	2
Yes	No

6. General comments about your experiences in this study:

Table 1. Freshman Retention for UNR, Liberal Arts &amp; Psychology: Fall 2008 – Fall 2009

<b>UNR Total</b>	<b>Number Retained</b>	<b>Percent Retained</b>	<b>Retained as Sophomore</b>	<b>Percent Sophomore</b>
<b>University</b>				
New Freshmen (N= 2261)				
Retained at University	1800	79.6%	1232	68.4%
<b>College of Liberal Arts</b>				
New Freshmen (N=375)				
Retained at University	298	79.5%	204	68.5%
Retained in College	238	63.5%	166	69.7%
<b>Psychology Department</b>				
New Freshmen (N=106)				
Retained at University	85	80.2%	65	76.5%
Retained in College	63	59.4%	48	76.2%
Retained in Department	50	47.2%	39	78.0%

a. Percentage and raw number of freshman and sophomore students retained for UNR, Liberal Arts & Psychology from Fall 2008 – Fall 2009

Table 2. Means and Standard Deviations of Cumulative GPA at Pre & Post for the Experimental Groups during the spring 2009 Semester

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (N=48)	3.1356	.7093	3.1682	.6626
VC1 Group (N=51)	3.1338	.6220	3.2328	.5593
VC2 Group (N=33)	3.1452	.5388	3.1378	.4447
Total (N=132)	3.1356	.0572	3.1954	.0181

*Note.* Means and Standard Deviations for the three experimental groups at pre and post on the measure of cumulative GPA. The spring 2009 semester was *baseline* (instead of pre) and *pre* (instead of post) for the VC2 group.

Table 3. Univariate ANOVA of Cumulative GPA at Post for the Experimental Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	2	624.267	.906	.000	1.000
Intercept	1	41.645	.244	.000	1.000
CUM_GPA_PRE	1	1247.580	.906	.000	1.000
Condition	1	2.737	.021	.100	.375
Error	129				
Total	132				
Corrected Total	131				

*Note.* ANOVA comparing the differences between the three experimental groups on the measure of cumulative GPA.

<sup>a</sup>R Square = .906 (Adjusted R Square = .905). <sup>b</sup>Computed using alpha = .05

Table 4. ANCOVA of Cumulative GPA at Post for the Experimental Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	4	322.604	.910	.000	1.000
Intercept	1	26.805	.174	.000	.999
CUM_GPA_PRE	1	1025.150	.890	.000	1.000
MILL_PRE	1	5.090	.039	.026	.610
AGE_PRE	1	2.211	.017	.140	.314
Condition	1	4.100	.031	.045	.520
Error	127				
Total	132				
Corrected Total	131				

*Note.* ANCOVA comparing the differences between the three experimental groups on the measure of cumulative GPA.

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: AGE\_PRE = 22.30, MILL\_PRE = 1.55.

<sup>b</sup>R Square = .910 (Adjusted R Square = .908). <sup>c</sup>Computed using alpha = .05

Table 5. Omnibus 2x2 MMRM of Fixed Effects of Cumulative GPA from Pre to Post for the Experimental *Conditions*

**Type III Tests of Fixed Effects**

Source	Numerator <i>df</i>	Denominator <i>df</i>	<i>F</i>	<i>p</i>	<i>d</i>
Intercept	1	127.896	161.461	.000	2.25
MILL_PRE	1	127.000	29.652	.000	.97
AGE_PRE	1	127.000	4.940	.028	.39
GENDER	1	127.000	.490	.485	.12
PrePo	1	130.000	13.556	.000	.65
Condition	1	128.035	.094	.760	.05
Condition * PrePo	1	130.000	3.462	.065	.33

*Note.* Omnibus 2x2 MMRM analysis comparing the differences between the two experimental *conditions* on the measure of cumulative GPA at two points in time (i.e., pre and post).

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: MILL\_PRE = 1.55, AGE\_PRE = 22.30, Male or Female = 1.78.

<sup>b</sup>Computed using alpha = .05. <sup>c</sup>Dependent Variable: Cumulative GPA.

Table 6. Contrast Estimates of Cumulative GPA from Pre to Post for the Experimental Conditions

Contrast	Estimate	Std. Error	<i>df</i>	<i>t</i>	<i>d</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
GS vs. VC at Pre	.002	.105	128.961	.022	.04	.982	-.204575	-.209220
GS vs VC at Post	-.062	.093	127.254	-.665	.12	.507	-.246809	-.122599
GS vs. VC: Pre to Post	-.064	.035	130.000	1.861	.33	.065	-.004073	.132928

*Note.* These contrast estimates are post hoc analyses to the 2x2 MMRM analysis comparing the two experimental conditions at two different times (pre and post).

<sup>a</sup>Computed using alpha = .05. <sup>b</sup>Dependent Variable: Cumulative GPA.

Table 7. Omnibus 3x3 MMRM of Fixed Effects of Cumulative GPA from Pre to Follow-up for the Experimental Groups

**Type III Tests of Fixed Effects**

Source	Numerator <i>df</i>	Denominator <i>df</i>	<i>F</i>	<i>p</i>	<i>d</i>
Intercept	1	125.283	151.273	.000	2.20
MILL_PRE	1	126.329	28.950	.000	.96
AGE_PRE	1	125.678	5.535	.020	.42
GENDER	1	125.128	.312	.577	.10
TIME	2	122.539	4.206	.017	.37
Condition	2	126.174	.028	.972	.03
Condition * TIME	4	122.657	4.500	.002	.38

*Note.* 3x3 MMRM comparing the differences between the three experimental groups on the measure of cumulative GPA at three different points in time (i.e., pre, post, and follow-up)

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: MILL\_PRE = 1.54, AGE\_PRE = 22.32, Male or Female = 1.77.

<sup>b</sup>Computed using alpha = .05. <sup>c</sup>Dependent Variable: Cumulative GPA.

Table 8. Contrast Estimates of Cumulative GPA from Pre to Follow-up for the Experimental Groups

Contrast	Estimate	Std. Error	<i>df</i>	<i>t</i>	<i>d</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
GS vs. VC1: Pre to Post	.070	.034	129.000	2.046	.42	.043	.002318	.138303
GS vs. VC2: Pre to Post	-.038	.039	129.000	-.982	.22	.328	-.114420	.038493
VC1 vs. VC2: Pre to Post	-.108	.038	129.000	-2.836	.64	.005	-.183808	-.032739
GS vs. VC1: Post to F-up	-.055	.042	116.077	-1.298	.26	.197	-.139289	.029004
GS vs. VC2: Post to F-up	.079	.045	114.701	1.752	.40	.083	-.010308	.167813
VC1 vs VC2: Post to F-up	.134	.046	115.462	2.922	.66	.004	.043139	.224651

*Note.* These contrast estimates are post hoc analyses to the 3x3 MMRM analysis comparing the three experimental groups at three different times (pre, post, and follow-up).

<sup>a</sup>Computed using alpha = .05. <sup>b</sup>Dependent Variable: Cumulative GPA.

Table 9. Means and Standard Deviations of Cumulative GPA at Pre & Post for Experimental & Comparison Groups

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (N=48)	3.1846	.7093	3.2162	.6626
VC1 Group (N=51)	3.0758	.6220	3.1833	.5593
VC2 Group (N=33)	3.0993	.5388	3.1869	.4447
Comparison Group (N=286)	3.0479	.6238	3.0748	.6018
Comparison Group (N=161)	3.0888	.5451	3.1005	.5381
Total (N=579)	3.0794	.6012	3.1114	.5756

*Note.* Means and Standard Deviations for the experimental and comparison groups at pre and post on the measure of cumulative GPA.

Table 10. Univariate ANOVA of Cumulative GPA at Post for Experimental & Comparison Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	3	1692.905	.898	.000	1.000
Intercept	1	69.494	.108	.000	1.000
Pre Cumulative GPA	1	5034.665	.897	.000	1.000
Condition	2	6.652	.023	.001	.913
Error	575				
Total	579				
Corrected Total	578				

*Note.* ANOVA comparing the differences between the three experimental groups on the measure of cumulative GPA.

<sup>a</sup>R Square = .898 (Adjusted R Square = .898). <sup>b</sup>Computed using alpha = .05.

Table 11. ANCOVA of Cumulative GPA at Post for Experimental &amp; Comparison Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	5	1035.874	.900	.000	1.000
Intercept	1	63.923	.100	.000	1.000
Pre Cumulative GPA	1	4106.527	.878	.000	1.000
MILL_PRE	1	12.025	.021	.001	.933
AGE_PRE	1	1.616	.003	.204	.245
Condition	2	6.169	.021	.002	.890
Error	573				
Total	579				
Corrected Total	578				

*Note.* ANCOVA comparing the differences between the three experimental groups on the measure of cumulative GPA.

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: MILL\_PRE = 1.66, AGE\_PRE = 23.54.

<sup>b</sup>R Square = .900 (Adjusted R Square = .900). <sup>c</sup>Computed using alpha = .05

Table 12. Omnibus 4x3 MMRM Fixed Effects of Cumulative GPA from Pre to Follow-up for Experimental & Comparison Groups

<b>Type III Tests of Fixed Effects</b>					
Source	Numerator <i>df</i>	Denominator <i>df</i>	<i>F</i>	<i>p</i>	<i>d</i>
Intercept	1	396.801	507.658	.000	2.26
MILL_PRE	1	400.727	80.920	.000	0.90
AGE_PRE	1	395.075	20.876	.000	0.46
GENDER	1	403.057	3.307	.070	0.18
TIME	2	260.808	4.566	.011	0.26
Condition	3	406.044	.068	.977	0.03
Condition * TIME	6	267.179	3.345	.003	0.22

*Note.* 4x3 MMRM comparing the differences between the three experimental groups and the comparison group on the measure of cumulative GPA at three different points in time (i.e., pre, post, and follow-up).

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: MILL\_PRE = 1.66, AGE\_PRE = 23.54, Male or Female = 1.68.

<sup>b</sup>Computed using alpha = .05. <sup>c</sup>Dependent Variable: Cumulative GPA

Table 13. Contrast Estimates of Cumulative GPA from Pre to Follow-up for Experimental & Comparison Groups

Contrast	Estimate	Std. Error	<i>df</i>	<i>t</i>	<i>d</i>	<i>p</i>	95% Confidence Interval	
							Lower Bound	Upper Bound
VC1 vs. VC2: Pre to Post	-.108	.044	414.003	-2.473	.64	.014	-.194341	-.022206
VC1 vs. Comparison: Pre to Post	-.075	.030	414.003	-2.517	.46	.012	-.133542	-.016425
GS vs. VC2: Pre to Post	-.038	.044	414.003	-.857	.19	.392	-.125081	.049155
GS vs. Comparison: Pre to Post	-.005	.031	414.003	-.153	.02	.879	-.064764	.055419
VC2 vs. Comparison: Post to F-up	-.075	.034	271.456	-2.232	.43	.026	-.140850	-.008815
VC1 vs. Comparison: Post to F-up	.060	.031	278.478	1.941	.34	.053	-.000852	.120315
GS vs. Comparison: Post to F-up	.005	.030	274.979	.157	.03	.875	-.053897	.063247

*Note.* These contrast estimates are post hoc analyses to the 4x3 MMRM analysis comparing the three experimental groups and the comparison group at three different times (pre, post, and follow-up).

<sup>a</sup>Computed using alpha = .05. <sup>b</sup>Dependent Variable: Cumulative GPA.

Table 14. Raw Means and Standard Deviations of Semester GPA at Pre & Post for Experimental & Comparison Groups

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (N=48)	3.1797	.8928	3.3091	.6676
VC1 Group (N=51)	3.1464	.7453	3.2993	.6943
VC2 Group (N=33)	3.1622	.7978	3.3481	.6033
Comparison Group (N=286)	3.1383	.7506	3.2162	.7289
Comparison Group (N=161)	3.2612	.6311	3.1126	.8668
Total (N=579)	3.1719	.7487	3.2116	.7546

*Note.* Means and Standard Deviations for the three experimental groups and two comparison groups at pre and post on the measure of semester GPA.

Table 15. Univariate ANOVA of Semester GPA at Post for Experimental &amp; Comparison Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	3	220.606	.535	.000	1.000
Intercept	1	96.899	.144	.000	1.000
Pre Semester GPA	1	653.935	.532	.000	1.000
Condition	2	4.141	.014	.016	.731
Error	575				
Total	579				
Corrected Total	578				

*Note.* ANOVA comparing the differences between the three experimental groups and the comparison group on the measure of semester GPA.

<sup>a</sup>R Square = .535 (Adjusted R Square = .533). <sup>b</sup>Computed using alpha = .05.

Table 16. ANCOVA of Semester GPA at Post for Experimental &amp; Comparison Groups

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>	Observed Power
Corrected Model	5	137.532	.545	.000	1.000
Intercept	1	51.943	.083	.000	1.000
Pre Semester GPA	1	556.814	.493	.000	1.000
MILL_PRE	1	8.050	.014	.005	.809
AGE_PRE	1	8.994	.015	.003	.894
Condition	2	4.029	.014	.018	.718
Error	573				
Total	579				
Corrected Total	578				

*Note.* ANCOVA comparing the differences between the three experimental groups and the comparison group on the measure of semester GPA.

<sup>a</sup>Covariates appearing in the model are evaluated at the following values: MILL\_PRE = 1.66, AGE\_PRE = 23.54.

<sup>b</sup>R Square = .545 (Adjusted R Square = .542). <sup>c</sup>Computed using alpha = .05.

Table 17. Student Retention of Psychology Majors: Spring 2009 – Fall 2009

	GS (N=48)	VC1 (N=51)	VC2 (N=33)	Comparison Group (N=286)
Did Not Complete Spring 2009 Semester	N/A	N/A	N/A	18% (n=51)
Graduated in the Spring 2009 Semester	4% (n=2)	12% (n=6)	N/A	24% (n=70)
Did Not Re-enroll in Fall 2009 Semester	N/A	N/A	N/A	1% (n=4;N=286)
Did Not Complete Fall 2009 Semester	4% (n=2)	10% (n=5)	N/A	12% (n=19;N=161)
Graduated in the Fall 2009 Semester	23% (n=11)	12% (n=6)	15% (n=5)	35% (n=57;N=161)
Did Not Re-enroll in Spring 2010 Semester	6% (n=2;N=33)	3% (n=1;N=34)	4% (n=1;N=28)	19% (n=16;N=85)

*Note.* This table depicts the raw number and percentage of students from each group (the three experimental and comparison groups) that dropped out, graduated, or did not re-enroll in classes for the spring 2009, fall 2009, and spring 2010 semester.

Table 18. Means and Standard Deviations of DASS 21 at Pre & Post for the Experimental Groups

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (n=16)	34.94	12.657	34.00	11.883
VC1 Group (n=14)	37.29	12.658	32.00	6.587
VC2 Group (n=18)	33.61	10.705	35.28	11.605
Total (n=48)	35.13	11.797	33.90	10.372

*Note.* This table presents the means and standard deviations from pre to post on the DASS 21 for the three experimental groups.

Table 19. Means and Standard Deviations of QOLS at Pre & Post for the Experimental Groups

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (n=16)	77.94	16.498	81.38	14.236
VC1 Group (n=14)	77.71	14.041	74.07	17.925
VC2 Group (n=18)	82.17	16.933	81.39	14.349
Total (n=48)	79.46	15.799	79.25	15.469

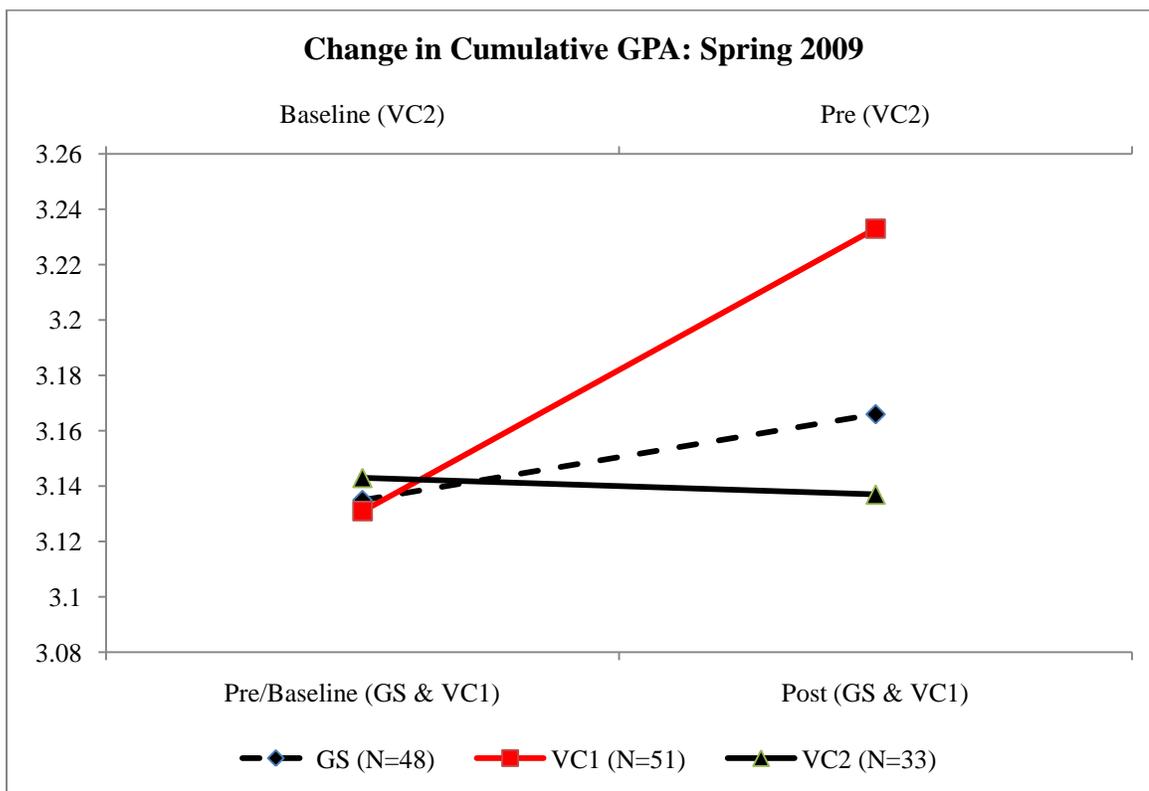
*Note.* This table presents the means and standard deviations from pre to post on the QOLS for the three experimental groups.

Table 20. Means and Standard Deviations of AAQ-2 at Pre & Post for the Experimental Groups

Group	<i>M</i> (Pre)	SD (Pre)	<i>M</i> (Post)	SD (Post)
GS Group (n=16)	46.06	14.206	50.63	11.523
VC1 Group (n=14)	49.86	11.799	54.14	10.264
VC2 Group (n=18)	54.11	9.887	54.28	10.576
Total (n=48)	50.19	12.247	53.02	10.720

*Note.* This table presents the means and standard deviations from pre to post on the AAQ-2 for the three experimental groups.

Figure 1. Change in mean cumulative GPA for the Experimental Groups



*Figure 1.* Relative change in mean cumulative GPA prior to and after training for the GS and VC1 groups (baseline and pre-training for the VC2 group) from the beginning to the end of the spring 2009 semester.

Figure 2. 2x2 MMRM Adjusted Mean Plot of Cumulative GPA at Pre & Post for Experimental *Conditions*

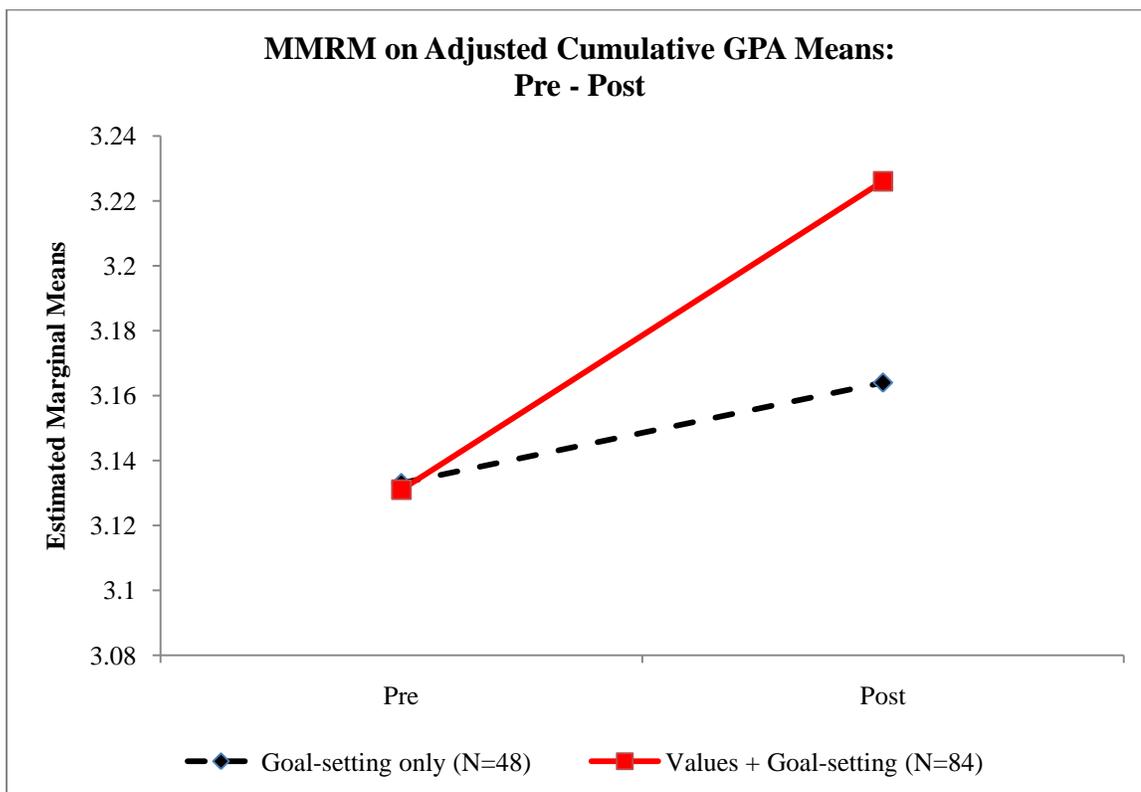


Figure 2. Relative change in mean cumulative GPA comparing the goal-setting training alone *condition* with the values plus goal-setting training *condition* for the spring 2009 semester. Cumulative GPA means for the VC1 and VC2 groups were pooled into one *condition* to compare differences between the two conditions.

Figure 3. 3x3 MMRM Adjusted Mean Plot of Cumulative GPA at Pre, Post & Follow-up for the Experimental Groups

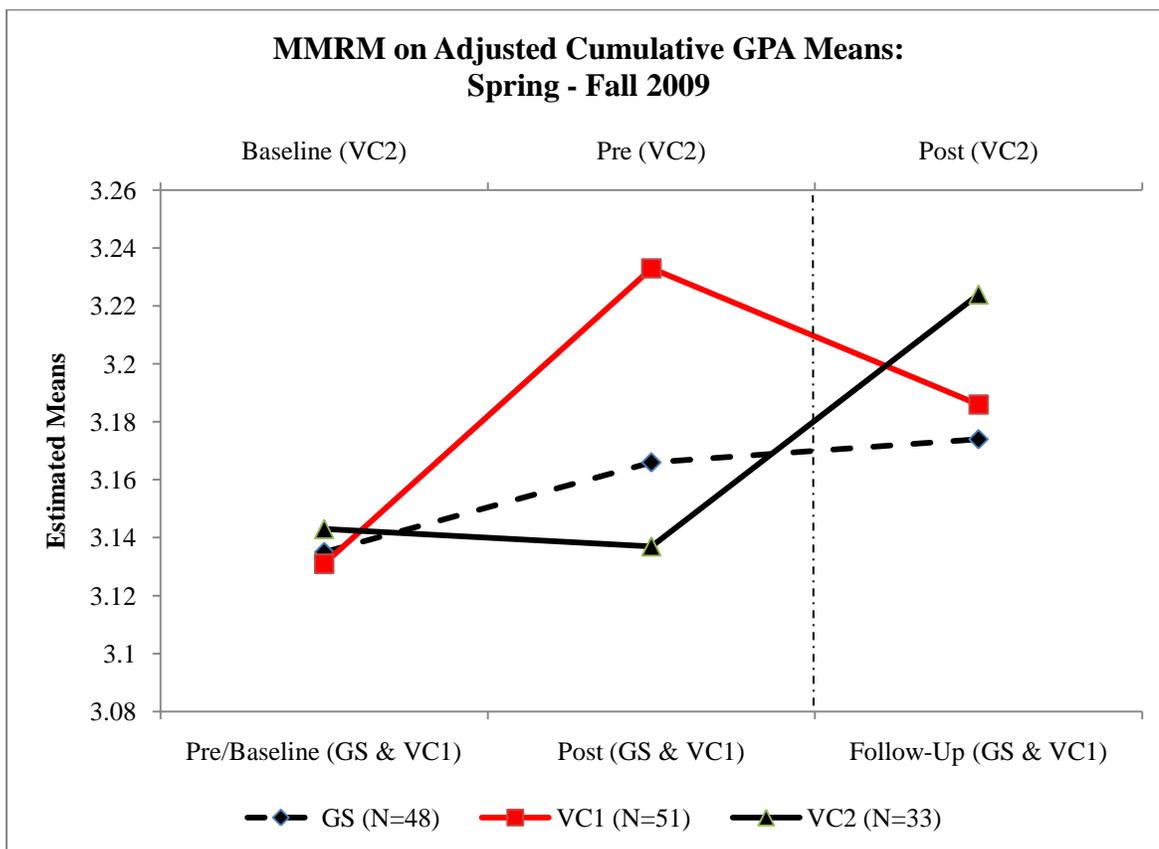


Figure 3. Relative change in mean cumulative GPA at three different time periods for each of the experimental groups. The GS and VC1 groups received training during the spring 2009 semester and the VC2 group was exposed to training in the fall 2009 semester.

Figure 4. Cumulative GPA at Pre &amp; Post for Experimental and Comparison Groups

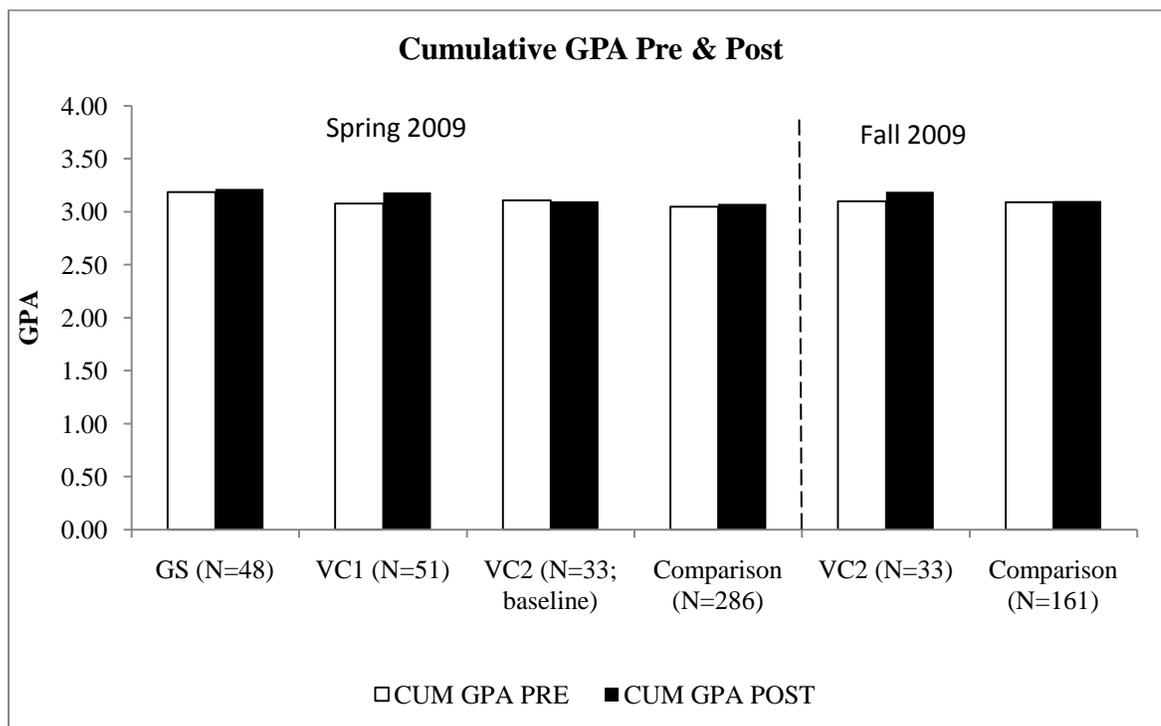


Figure 4. Raw means of cumulative GPA at pre and post (i.e., beginning and end of semester) for the experimental and comparison groups. Note: spring 2009 was baseline for the VC2 group.

Figure 5. Change in Cumulative GPA for Experimental and Comparison Groups

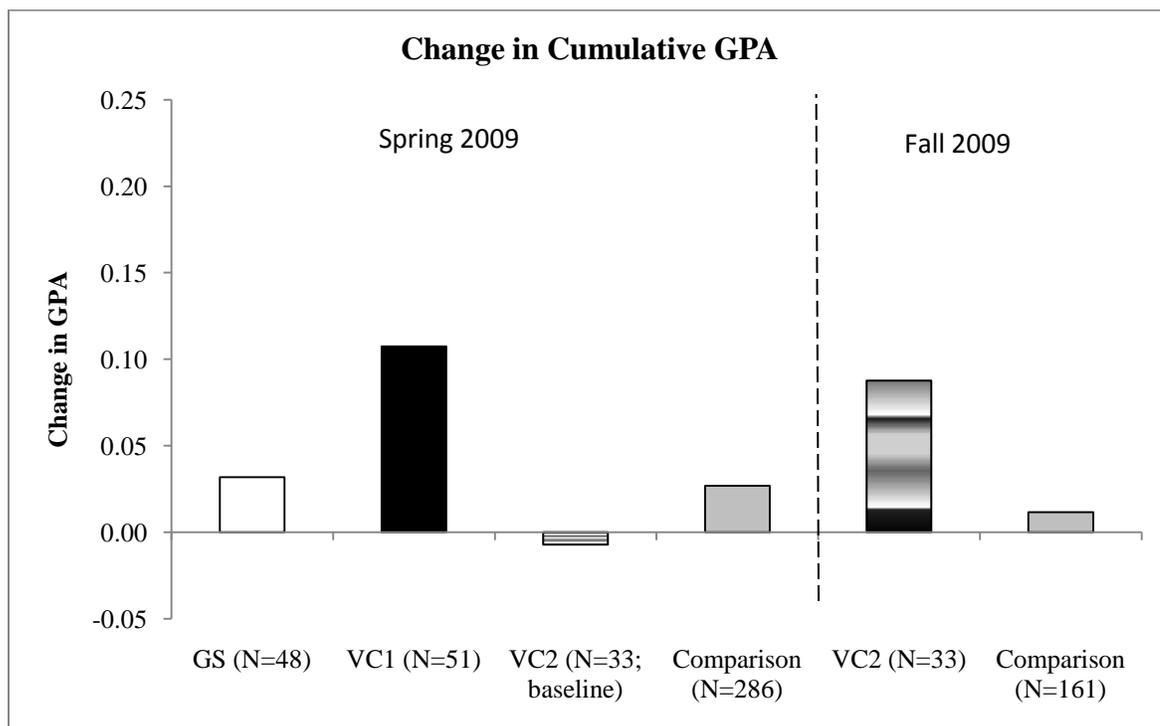


Figure 5. Relative change in mean cumulative GPA at the end of the spring and fall 2009 semesters for the experimental and comparison groups. Note: spring 2009 was baseline for the VC2 group.

Figure 6. Adjusted Mean Plot of Cumulative GPA at Pre & Post for Experimental and Comparison Groups

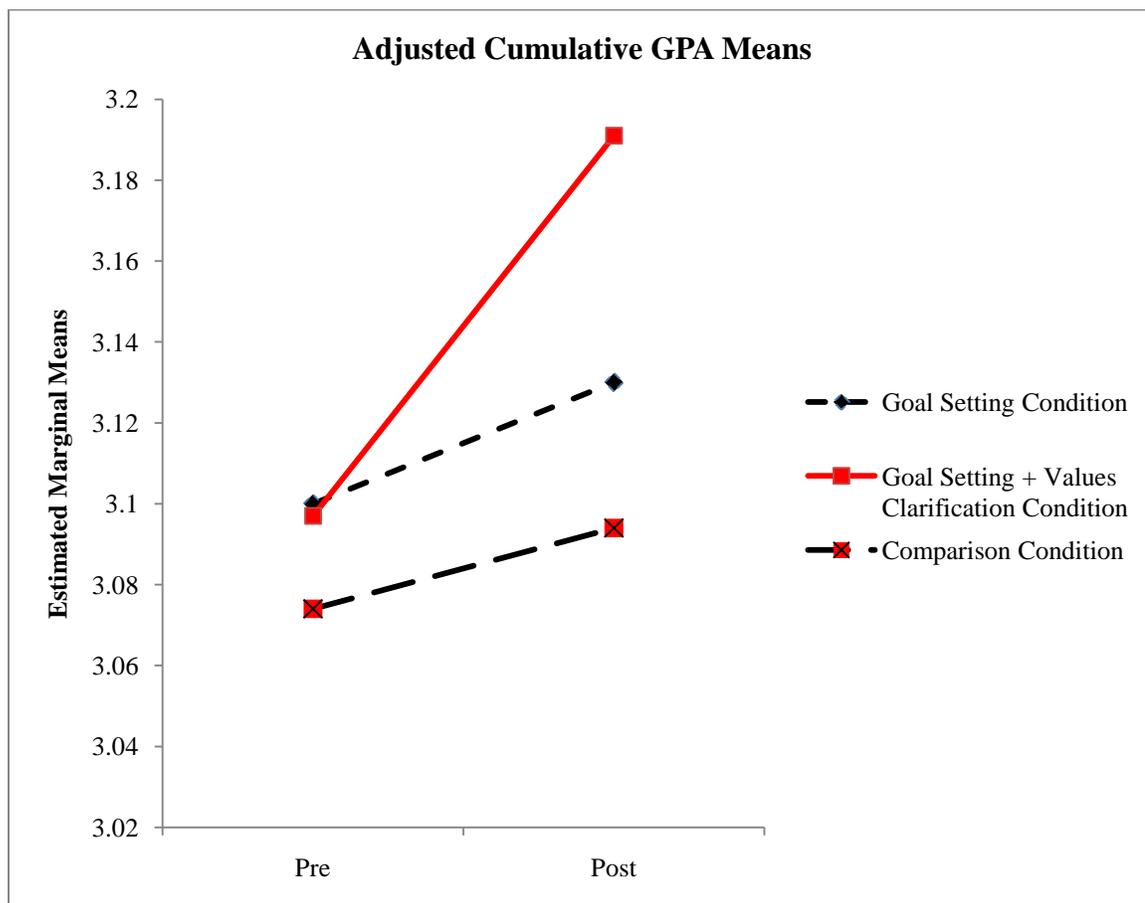


Figure 6. Relative change in mean cumulative GPA comparing the goal-setting training alone *condition* with the values plus goal-setting training *condition* for the spring 2009 semester. Cumulative GPA means for the VC1 and VC2 groups were pooled into one *condition* to compare differences between the two conditions and further examined in relation to the comparison condition. Covariates were evaluated at the following values: MILL\_PRE = 1.66, AGE\_PRE = 23.54.



Figure 8. Cumulative GPA Ranges at Pre & Post for Experimental and Comparison Groups

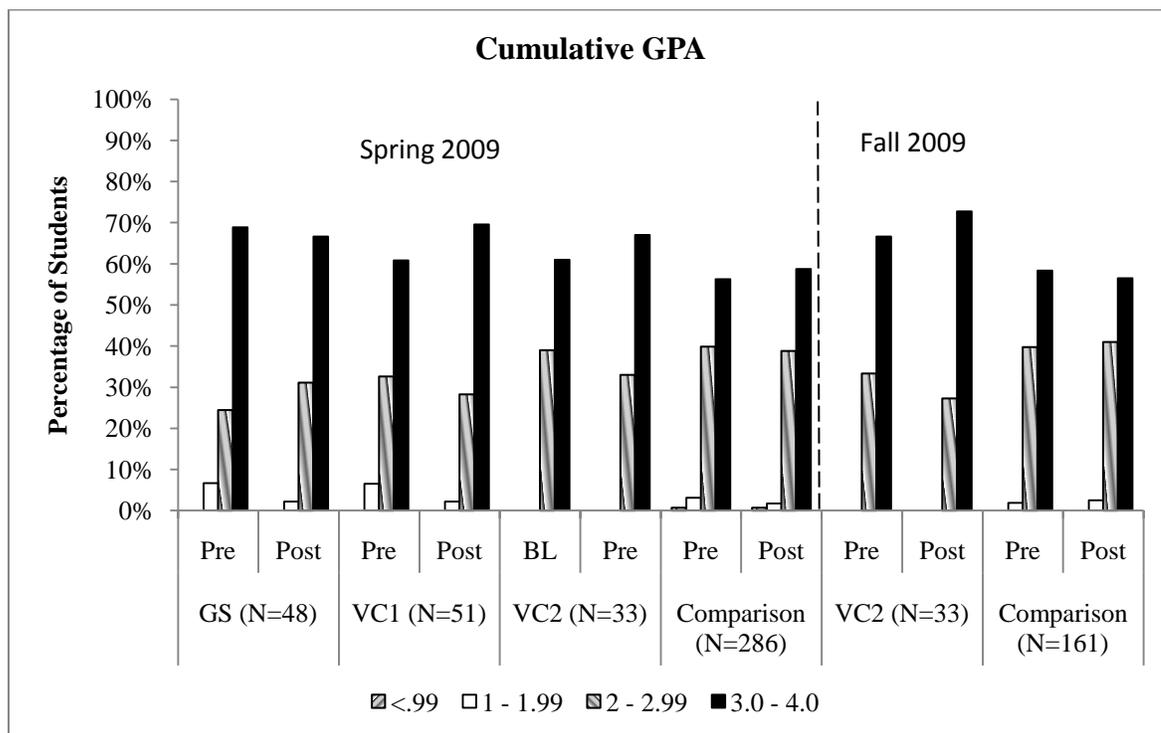


Figure 8. Changes in the percentage of students falling into four different cumulative GPA ranges from pre to post (i.e., beginning and end of semester) across the three experimental groups and for the comparison group. Note: spring 2009 was baseline for the VC2 group.

Figure 9. Relative Change in Cumulative GPA Range for Experimental and Comparison Groups

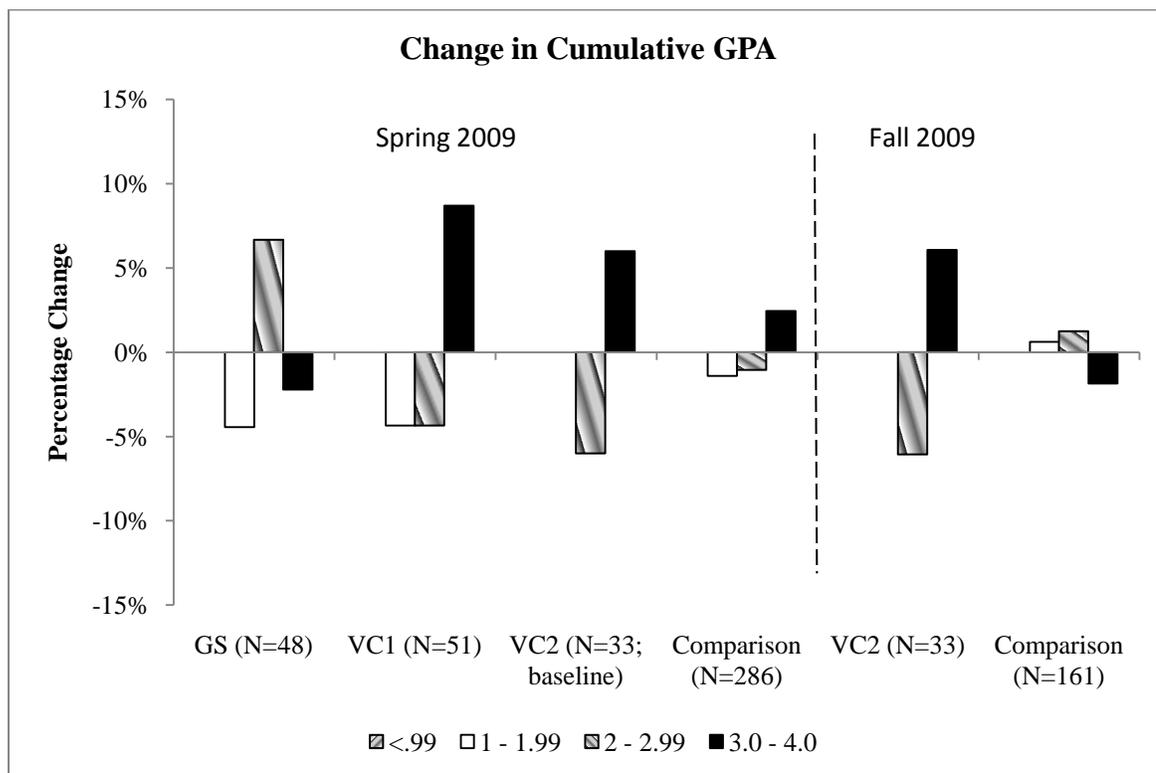


Figure 9. Relative changes in the percentage of students falling into four different cumulative GPA ranges across the three experimental groups and for the comparison group. Note: spring 2009 was baseline for the VC2 group.

Figure 10. Semester GPA: Pre &amp; Post for Experimental and Comparison Groups

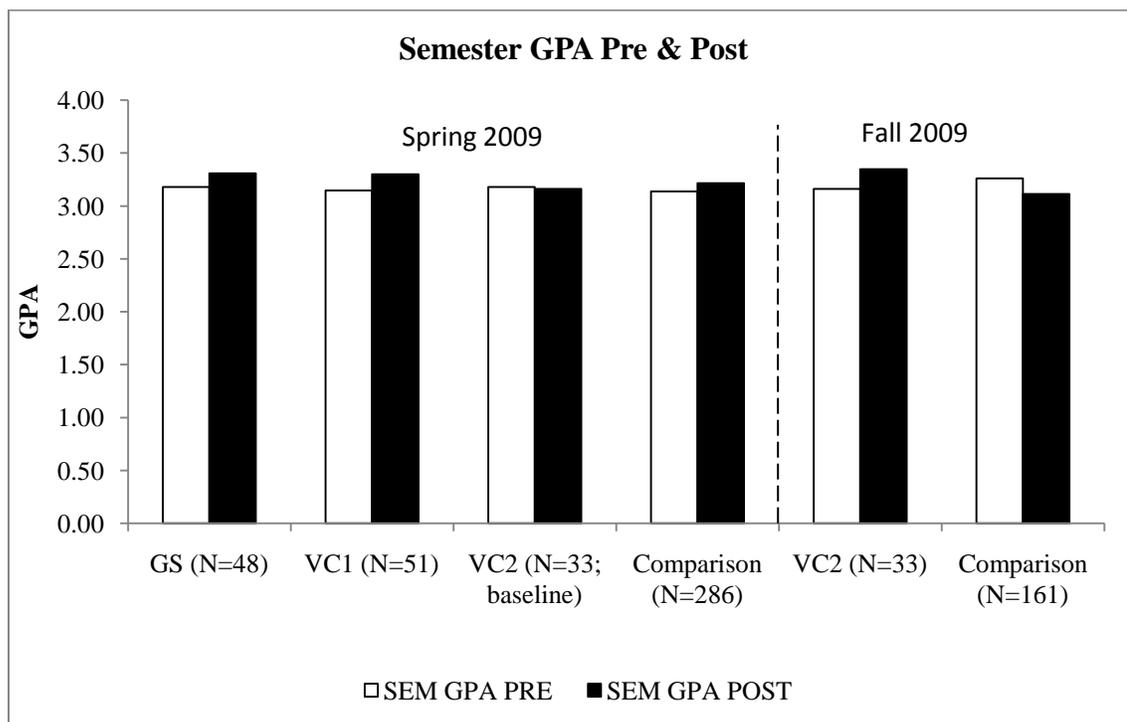


Figure 10. Raw means of semester GPA at pre and post (i.e., beginning and end of semester) for the experimental and comparison groups. Note: spring 2009 was baseline for the VC2 group.

Figure 11. Change in Semester GPA for Experimental and Comparison Groups

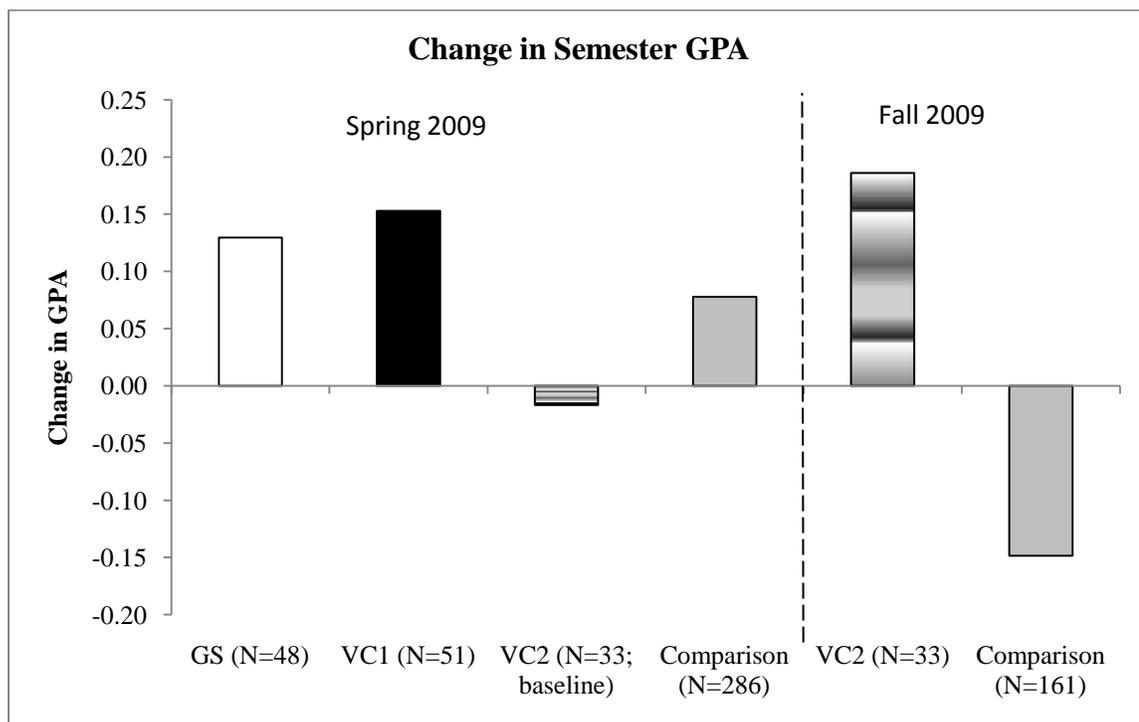


Figure 11. Relative change in mean semester GPA at the end of the spring and fall 2009 semesters for the experimental and comparison groups. Note: spring 2009 was baseline for the VC2 group

Figure 12. Adjusted Mean Plot of Semester GPA: Pre & Post for Experimental and Comparison Groups

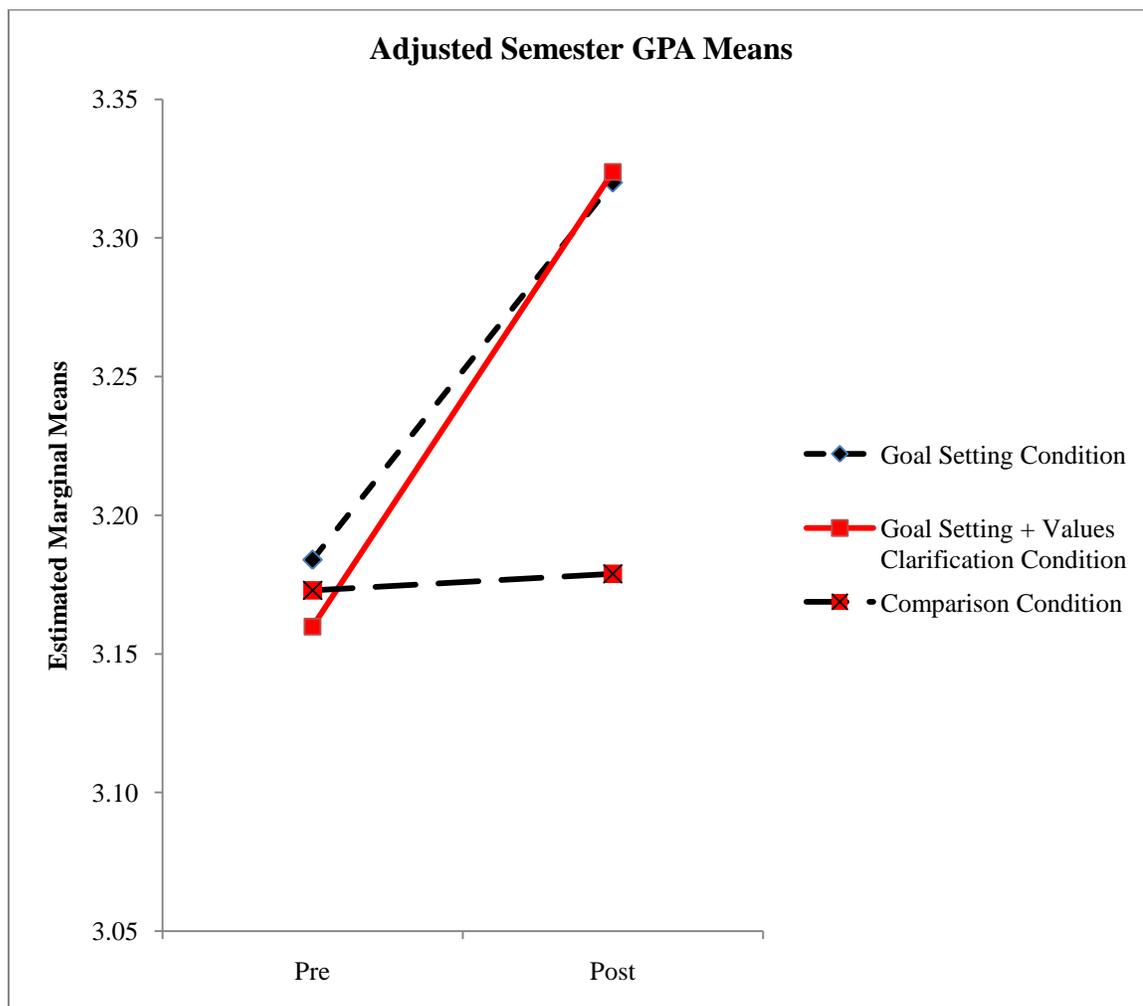


Figure 12. Relative change in mean semester GPA comparing the goal-setting training alone *condition* with the values plus goal-setting training *condition* for the spring 2009 semester. Semester GPA means for the VC1 and VC2 groups were pooled into one *condition* to compare differences between the two conditions and further examined in relation to the comparison condition. Covariates appearing in the model are evaluated at the following values: AGE\_PRE = 23.87, MILL\_PRE = 1.67.

Figure 13. Semester GPA Ranges at Pre & Post for Experimental and Comparison Groups

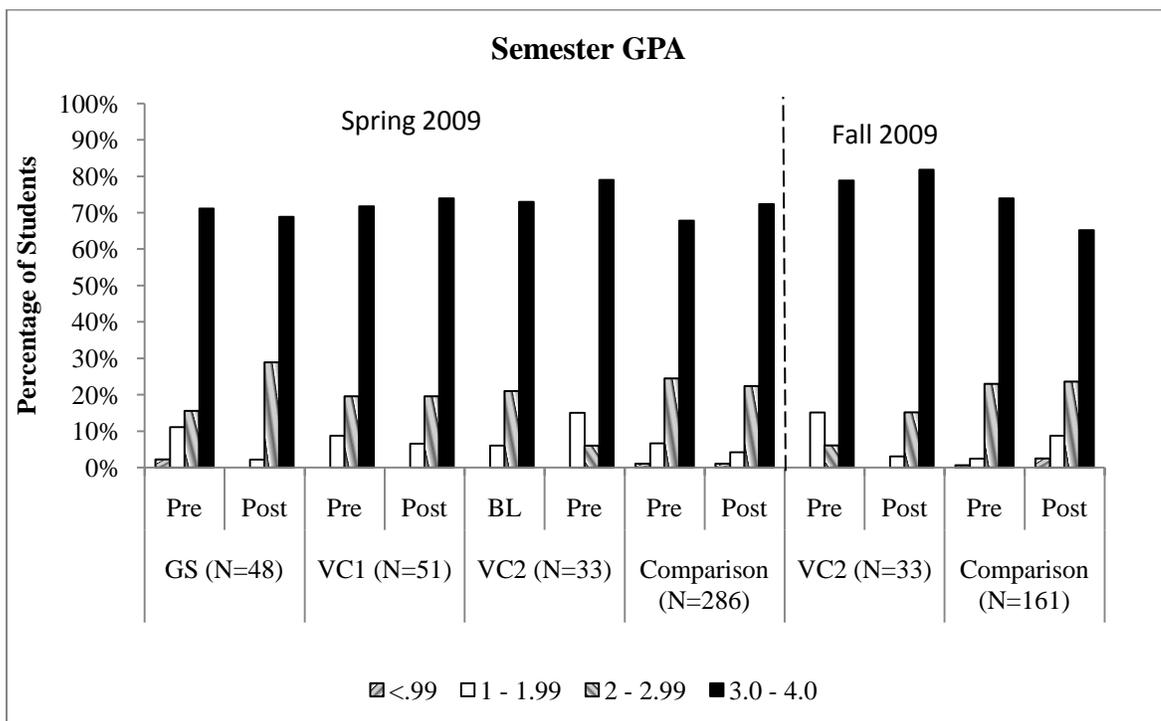


Figure 13. Changes in the percentage of students falling into four different semester GPA ranges from pre to post (i.e., beginning and end of semester) across the three experimental groups and for the comparison group. Note: spring 2009 was baseline for the VC2 group.

Figure 14. Relative Change in Semester GPA Range for Experimental and Comparison Groups

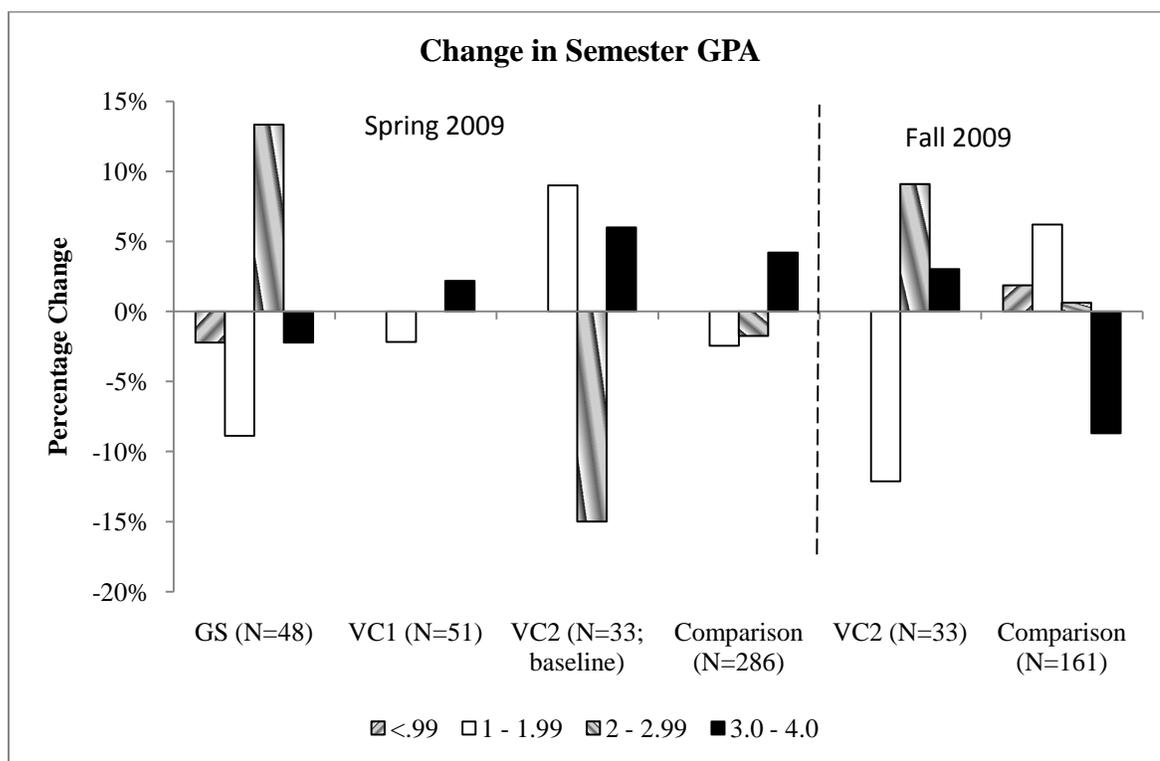


Figure 14. Relative changes in the percentage of students falling into four different semester GPA ranges across the three experimental groups and for the comparison group. Note: spring 2009 was baseline for the VC2 group.