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The malleability of university students' beliefs, values, and attitudes in the classroom setting

Glory Emmanuel

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**THE MALLEABILITY OF UNIVERSITY STUDENTS'
BELIEFS, VALUES, AND ATTITUDES
IN THE CLASSROOM SETTING**

by

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DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Doctor of Philosophy
Psychology**

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DEDICATION

I dedicate this research study to:

My husband-to-be, Isaac Aviña: each step we take together creates our legacy together.

My parents and siblings for their immeasurable love and encouragement.

My friends and colleagues who helped turn the moments into victory.

My Lord and Savior Jesus Christ: the foundation for my values, the reason for my faith, and the source of my calling. You are the greatest victory we have.

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ABSTRACT

Beliefs, values, and attitudes (BVAs) are central to a person's identity and worldview but can be refined and influenced through the individual's surrounding environment and experience. The academic setting is one environment that impacts BVAs. This study examined if university students' BVAs are influenced over a semester by students' attributes, their professor, and the classroom context by testing three main hypotheses: 1) students demonstrate BVA change over time while professors' BVAs remain relatively stable over time; 2) students' attributes influence BVA change; and 3) students, especially those who have a positive experience in the class, assimilate to their professor's BVAs. In a sample of 19 classrooms, 14 professors, and 413 students, it was found that students' BVAs did change over time, both for values-based classes and for non-values based classes. Students' attributes, specifically their initial commitment to

values and religious commitment, were predictive of BVA change with those more committed to values reporting less BVA change over the semester. Students were found to assimilate their values to their professor's values. This was influenced by class type (values versus non-values based) and students' belief in their professor's ability to teach. The impact of religiosity was the most consistent and robust finding in this study. The magnitude and direction of change in students' BVAs were influenced by their professor's level of religiosity. Students with more religious professors tended to increase their religious commitment and endorsement of instrumental values overall, whereas students with less religious professors tended to decrease their religious commitment and endorsement of instrumental values overall. This indicates that the secular, public university context is able to influence students' BVAs specifically through the course material and class format. More importantly, professors are in a position of authority and, therefore, can induce students to adopt their personal values. The benefits and concerns of value assimilation are discussed.

Keywords: attitudes, beliefs, classroom, teacher, values, university students,

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Chapter 1

Introduction

Beliefs, values, and attitudes (BVAs) have been an area of high interest for social scientists because of the insight they provide into higher-level cognitions and the influence they have on decision-making and behavior. A broad array of disciplines, from psychology, sociology, and education to environmental science, business, and economics, has fostered research on understanding the hierarchical structure of beliefs, values, and attitudes. The nature and interrelationships between these underlying factors encourage social scientists to focus their research to examine the impact of BVAs as well as how BVAs may be influenced by external forces to achieve a desired behavior.

Past and current psychological research has endeavored to define beliefs, values, and attitudes, to examine how they relate to each other, and to decipher how they may be measured. The literature also provides a deeper understanding of how BVAs are formed, their resiliency as well as vulnerability, and different settings where BVAs are manifested in both positive and negative ways. One factor is the presence of a power differential. An individual or group associated with a lower status may be influenced to alter their beliefs, values, and attitudes so that they are more closely aligned to their superior. The nature of BVAs and areas of influence, including the presence of a power differential, have been explored in different domains. This research draws on findings from empirical literature in the areas of clinical psychology, cross-cultural research, the corporate workplace, religiosity/spirituality (RS), and academia.

In the current study, focus is directed to the academic setting where the BVAs of university students are found to be influenced by the classroom context, and, more specifically, their professors. The current study investigates if the BVAs of students are influenced in the academic setting and what aspects of the educational environment are

key contributors. Prior to describing the details of the current study, an overview of the BVA literature is presented. This overview presents definitions for beliefs, values, and attitudes that have evolved over time and how BVAs have been empirically researched across the domains of clinical psychology, cross-cultural research, the corporate workplace, religiosity/spirituality (RS), and academia.

Definition of Beliefs, Values, and Attitudes

Beliefs, values, and attitudes (BVAs) are distinct yet intertwined constructs. In summary, beliefs refer to thoughts and assumptions that an individual or group trusts to be true; values are enduring beliefs toward a specific mode of conduct or end-state of existence that is personally or socially preferable and prioritized by their degree of emotion, significance, and impact; and attitudes are a summation of beliefs and values, and are the predisposition one has to respond positively or negatively toward specific stimuli. Each of these constructs is explored more thoroughly below.

Beliefs. In the hierarchical relationship of BVAs, beliefs are the initial conviction that flow into values and then attitudes. Beliefs are basic premises that are considered to be true and guide behavior by providing a central, organizational framework. Historically, beliefs were regarded as often being the freely chosen result of rational deliberation. One example of this is Pascal's Wager (Cargile, 1966). Blaise Pascal (1623 – 1662) argued that all humans bargain with their lives when they consider the existence of God. Since there is the possibility that God does exist, rationally it would be better to believe in God because this option maximizes rewards and mitigates negative consequences. Pascal's Wager states that if God does not exist, a person who has chosen to believe will only have a finite loss (worldly pleasures, etc.) compared to the

consequences a person who has chosen not to believe will have if God actually does exist (damnation, etc.). In the early 20th century, beliefs were defined less in terms of theology and more in regards to behavioral economics, “[beliefs are] the desires [which are] the result of conditioning forces continually at work in social and economic relations” (Lund, 1925, p. 174). In the 1960s this definition was updated to incorporate the nature of the relationship between beliefs, cognitive processes, and their impact on behavior. Katz (1960) stated that beliefs are “a description and perception of an object, its characteristics, and its relationship with other objects” (p. 163). Fishbein and Raven (1962) theorized that beliefs represent the cognitive dimensions of an object and the probability of its existence that must be taken into account when predicting behavior from values and attitudes. Research has also characterized the varying strengths of beliefs. Beliefs have been described as a reference to a perceived relationship between two objects or concepts where the perceived strength of the relationship varies across individuals (Leung et al., 2002). These various definitions all explain beliefs as thoughts that an individual trusts to be true with a level of confidence that may vary from weak to strong in nature. The strength of the belief may in turn influence the values and/or attitudes towards the stimuli involved.

Beliefs, as alluded to in the previous section, are a response to the stimuli in one’s environment and experiences. However, individuals do not absorb and develop beliefs towards all stimuli; there is a selection process that individuals use to cognitively filter through incoming data to develop specific beliefs. *Anchoring* is one process that is used to formulate beliefs. Tversky and Kahneman (1974) presented anchoring as a method in which individuals adhere to beliefs. One starts from an initial value and makes estimates

that are then adjusted to yield the final answer. The starting point is first suggested by formulating or partially computing the topic/problem, but these are insufficient estimates that are biased by one's initial perceptions. Thoughts are activated within a person's cognition by external stimuli or an experience. They are then actively considered by the individual. The thought is assigned a varying degree of confidence and conviction that transforms the thought to a psychological state in which the proposition is strongly considered to be true (Schwitzgebel, 2006). This anchoring process establishes a belief.

Although beliefs are defined as an individual's conviction that something is true, it is distinct from having knowledge. True knowledge is the belief in something that is confirmed to be true through direct observation or input (Malcolm, 1952). Despite having a sincere belief towards or in something, the conviction alone does not guarantee its truth. This distinction is important as it highlights how differently beliefs are formed compared to knowledge acquisition. Individuals acquire knowledge through the confidence in a belief and a process of confirmation and disconfirmation. Knowledge may be traced back to an objective order that contains content verifying the argument. In contrast, beliefs may represent what exists for the individual in domains beyond direct perception or inference from observed facts, and may just be cognitive structures adopted from what already exists in individuals' cultures (Pepitone, 1994).

Pepitone (1994) provides a classification system for beliefs. The following are his proposed categories of important, universal beliefs: religion (gods, human soul, resurrection, reincarnation, angels, devils, holy shrines, faith healing); secular (fate/destiny, good or bad luck, superstition, witchcraft, evil eye); paranormal (telepathy, precognition, psychokinesis, animal magnetism); personality (ability to control life

events, genius, sexuality, characterology); society (origins of class structure, economic systems); culture (ethnicity, race); and moral justice (distribution of resource, punishment of bad deeds and rewards of good deeds). Although the classification and characterization of beliefs is helpful, understanding their psychological function is also important.

Pepitone (1994) stated that beliefs have four primary functions: emotional, cognitive, moral, and social. In regards to emotional function, beliefs serve to directly reduce emotional pain or stress associated with feelings such as fear, anger, hope, awe, and/or uncertainty. The cognitive function is for beliefs to provide a structure that gives a sense of control over life events. Beliefs function for moral purposes to create a sense of moral order and certainty where good comes from good and bad from bad. Beliefs serve to enhance group solidarity by facilitating common group beliefs that foster social identity and confidence.

Pepitone's reflection on beliefs states that their formation is in response to individuals' need to cope with and explain external stimuli. As discussed by Kaye (1994), two types of beliefs are proposed: core and dispositional. This categorization captures the cognitive process for how beliefs are formed and describes the varying levels of confidence in and consideration of thoughts. Core beliefs are thoughts that have been actively reflected on with deliberate decision. Dispositional beliefs are decisions made about thoughts even though they have not necessarily been considered in any great depth. An example of a core belief is someone saying, "Yes, I believe in God," after thoughtful consideration of the evidence and implications, whereas a dispositional belief is someone saying, "Sure, I believe in God," when they have never reflected on the notion.

Specific to the academic setting, different forms of beliefs can enable students to function well in the classroom (see Astin, 1977). One form of belief relates to the subject matter. Students acquire knowledge as well as develop their own beliefs towards the class subject matter. For example, in the education classroom, a professor may teach that research has consistently found that high levels of reading comprehension are positively correlated with academic achievement; therefore, it is the country's duty to target reading comprehension in educational programs. The first point is a finding grounded in empirical data (knowledge) whereas the second is a belief based on theory and conviction. It is important for both professors and students to distinguish between knowledge and beliefs so that they know what aspects of their discipline are grounded facts versus debatable beliefs.

Another form of belief is the students' beliefs, or their personal convictions, about their own learning. In a longitudinal study by Caprara and colleagues, middle to high school students who had positive beliefs towards their self-efficacy had higher levels of openness to novel and different experiences (Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011). A third kind of belief is educators' beliefs about their students. Professors have varying levels of belief in their students' ability to learn. Richardson, Abraham, and Bond (2012) stated that it is critical for educators to be confident in their ability to teach and in their students' ability to learn, and also for educators to encourage students to believe that they have what it takes to learn the course material successfully.

In summary, beliefs are relatively stable cognitive structures that represent stimuli for individuals beyond what can be directly perceived or observed. Individuals' beliefs are formed and influenced by the external environment and personal experiences. Beliefs

take on varying levels of confidence and conviction, which further affects personal values and attitudes.

Values. Values are another topic in the psychological literature researched as a way to understand and explain cognitive processes and behaviors. A single value is defined as an enduring belief where a specific mode of conduct or an end-state of existence is preferable to a converse mode of conduct or end-state of existence (Rokeach, 1973). Although it is believed that values are taught and learned in isolation from other values in an absolute manner, a single value does not often operate in isolation but is rather integrated with other similar values to create a value system (Seligman & Katz, 1996). It is important to distinguish between a value and a value system because it is rare for an individual to operate on the basis of a single value and even rarer for that value to be consistently and equally applied to every situation. A value system is a cluster of individual values that are organized along a continuum of relative importance to facilitate a preferable mode of conduct or end-state (Rokeach, 1973). Systems of values demonstrate that there is a complexity to the nature of values. Individuals employ values with incredible versatility, guided by multiple, dynamic clusters of values that vary across time and display them differently to the self, friends, acquaintances, family, and strangers.

Researchers are interested in understanding the nature of values because of their implication for decision making and behavior. An individual's values are believed to serve as the criteria and the standards by which evaluations and decisions are made (Williams, 1979). Researchers are also interested in this area because knowing an individual's value system may allow others to determine why individuals engage in

specific behaviors and provide a means for the anticipation and prediction of decisions and behaviors (Schwartz & Bilsky, 1987).

Major psychologists who have developed a foundation for research in values include Milton Rokeach and Shalom H. Schwartz. Rokeach (1918 – 1988), a Polish-American social psychologist, published two books, *Beliefs, Attitudes, and Values* (1968b) and *The Nature of Human Values* (1973). It is in his first book that Rokeach provides a philosophical basis for the association of fundamental values with beliefs and attitudes. In his second book, *The Nature of Human Values*, he defines values in more depth and establishes five assumptions for discussing values: “(1) the total number of values that a person possesses is relatively small; (2) all men everywhere possess the same values to different degrees; (3) values are organized into value systems; (4) the antecedents of human values can be traced to culture, society and its institutions, and personality; and (5) the consequences of human values will be manifested in virtually all phenomena that social scientists might consider worth investigating and understanding” (p. 3).

Rokeach categorized values into two categories: *instrumental* and *terminal* values. Instrumental values are core to the individual and considered to be permanent in nature (1973). Examples include honesty, integrity, and creativity. There are two kinds of instrumental values: moral values and competence values. Moral values only refer to those that have an interpersonal focus and arouse emotions of guilt, conscience, or conviction when violated. Competence values are related to how one feels when they perceive themselves to be personally inadequate and as if their intelligence, logical reasoning, and/or imaginative abilities have been undermined. With moral values, the

feelings are related to wrongdoing while with competence the feelings are associated with personal downfall. Terminal values are based on desired states, objectives that one attempts to work towards. Examples include self-respect, financial security, and inner harmony. There are two types of terminal values: personal and social. Personal values are end-states that are centered on the self, such as salvation and peace, whereas social values focus on the collective world around the individual through values such as justice and brotherhood. Through this categorization of values, Rokeach (1973) developed a framework where terminal and instrumental values are ranked relative to each other by an individual and used as an internal reference to develop opinions, beliefs, and attitudes. Furthermore, by knowing an individual's values, Rokeach proposed that one could predict behavior, ranging from political affiliation to religious beliefs. This led researchers to conduct experiments in a variety of domains where they influenced values and measured the change in opinion and behavior. Examples of domains in which values have been investigated include but are not limited to: work values (Bennett, 1999); consumer values (Sheth, Newman, & Gross, 1991); environmental science (Stern, 2000); neuroscience research (Sugrue, Corrado, & Newsome, 2004); and academia (Astin, 1993).

Shalom H. Schwartz is a social psychologist who has also substantially contributed to the foundation of values research through cross-cultural studies. He began publishing his theory on values in the early 1990s, describing universal values as latent motivations and needs. Schwartz and Bilsky (1987) expanded Rokeach's theory of values and constructed a framework that lists universal requirements for values and a mapping of values to motivational domains, interests served, and goals. Schwartz's framework

describes values as cognitive representations for three universal human requirements: the biological needs of the human, the social and interactional requirements, and the social institutional demands for group welfare and survival. These three areas are not mutually exclusive and values are able to transform their universal role. For example, the desire to get along with an individual may result from a business need but may later be transformed into a flourishing friendship that meets the interpersonal needs of both parties. The motivational domains for values serve to categorize a range of values. Eight domains are specified with a description (related values from Rokeach's value framework are listed in parentheses): (1) enjoyment – to meet physical needs for pleasure (comfort, cheerfulness); (2) security – to survive physically and avoid threats (world peace, national security); (3) achievement – to develop and use skills from physical and social environments to thrive (ambition, social recognition); (4) self-direction – intrinsic desire to explore and understand reality as effective controlling agents (intellectual, imaginative); (5) restrictive conformity – restrain impulses and avoid hurting others' interests (politeness, obedience); (6) prosocial – positive, active concern for others (forgiveness, love); (7) social power – attaining a differentiating status (leadership, authority); and (8) maturity – acceptance and appreciation of social and physical reality as it is (wisdom, faith). Interests are individualistic, collectivistic, or both, and goals are terminal or instrumental. The formal definition of values is presented by Schwartz and Bilsky (1987) as, "A value is an individual's concept of a transituational [terminal, instrumental] *goal*, that expresses [individualistic, collectivist, both] *interests* concerned with a [enjoyment, security...maturity] *motivational domain* and evaluated on a range of importance [very important to unimportant] as a guiding principle in his/her life" (p. 553,

original italics). Overall, the purpose and nature of this framework is to capture the universals that values are founded on as well as provide a means for making distinctions across groups.

Building on Rokeach's major criterion that values in his defined framework must be "reasonably comprehensive and universally applicable" (1973, p. 89), Schwartz (1994) proposes ten types of values that are distinguished by their motivational goals and tested through cross-cultural research. The ten value types are: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. The value types are then structured into a set of dynamic relations that provides a way to relate values to other variables (see Schwartz, 1994 for a figure summarizing this model). To validate the cross-cultural generalization of his theory, Schwartz summarizes findings obtained from 97 samples of children to adults collected from 1988 to 1993 in 44 countries, which resulted in a total sample size of 25,863 respondents. He concluded through this study that values on a universal scale are desirable trans-situational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity. Hence, values serve as goals that: serve the interests of some social entity; motivate action with direction and emotional intensity; provide judgment for action; and are acquired through socialization and unique, personal, learning experiences.

Other psychology theories on values include those by the Allport-Vernon-Lindzey Study of Values and Hofstede's current research on global values. Allport, Vernon, and Lindzey (1960) developed the Study of Values survey that measured the strength and significance of six fundamental standards in a person's life. The six types of values they

proposed are: theoretical, social, aesthetic, religious, economic, and political. The survey consists of multiple-choice questions where respondents choose activities that they prefer most. Geert Hofstede is a professor and researcher in the field of organizational culture. His research has focused on developing a systematic framework for understanding and differentiating between countries' cultural standards (Hofstede, 1998). Contracted by IBM Corporation, he found that there are four largely independent dimensions of differences among national value systems: power distance (ranging from large to small), uncertainty avoidance (ranging from strong to weak), individualism versus collectivism, and masculinity versus femininity. There were thirty two questions that represented these four dimensions. Analyses of participants' responses to these 32 questions found that these four dimensions accounted for 49 percent of the variance in country mean scores (Hofstede, Neuijen, Ohayv, & Sander, 1990).

The academic setting is an appropriate context for value consideration and development. As stated by Derek Bok, former Harvard president, "universities should be among the first to reaffirm the importance of basic values such as honesty, promise keeping, free expression, and nonviolence...to help students develop a strong set of moral standards" (Bok, 1990, p. 100). Astin (2012) argued that it is futile to believe that liberal education is value-free; society is calling for values such as social responsibility, concern for others, empathy, and social responsibility to be qualities of higher education. A recent longitudinal study by Astin, Astin, and Lindholm (2011) found that students' undergraduate experiences are significantly enhanced when qualities such as caring and equanimity are developed over the course of their academic career.

Overall, values are concepts or beliefs that are concerned with desirable end states or behaviors that transcend specific situations and are linked to motivational goals (Rokeach, 1973). The educational context, specifically the professor in the classroom environment, has the opportunity to connect course material to broad terminal and instrumental values.

Attitudes. Gordon Allport (1954) firmly stated that the study of attitudes is “the most distinctive and indispensable concept in contemporary American social psychology” (p. 43). Attitudes capture the state of readiness that exert a dynamic influence upon an individual’s responses, creating a close relationship between attitude and behavior that is more intimate than the impact beliefs or values may have (Allport, 1935). The focus on attitude research has persisted in varying degrees since the 1930s. Research on attitudes flourished in the 1920s and 30s with social scientists such as Bogardus, Thurstone, and Likert who aimed to accurately measure attitudes. This diminished in the 1940s before re-emerging in the 1950s and 60s with a revived interest in attitude change. As recounted by McGuire (1989), attitude research had a third wave in the 80s and 90s with a concentration on attitude systems’ content, structure, and functioning. The importance of research on attitudes was evident then as well as now. Social scientists continue to pay careful attention to the nature of attitudes, how they are fostered, and their relationship to values and beliefs due to the strong connection they have with behavioral decisions and change.

Social scientists have attempted to adequately define attitudes as a distinct psychological construct. Rokeach (1973) defined an attitude as an organization of several beliefs around a specific object or situation, differentiating it from a value which refers to

a single belief of a very specific kind. Values, as defined earlier, contain a transcendental quality to guide attitudes and judgments. In contrast, an attitude is focused on a specified object or situation (Rokeach, 1973). Another definition describes attitudes as a psychological tendency expressed by evaluating a particular entity along a spectrum of favor or disfavor (Eagly & Chaiken, 1998). Similarly, Petty, Wegener, and Fabrigar (1997) define attitudes as a summary of evaluations of objects that range from positive to negative. The notion that attitudes fall on a spectrum is critical to their characterization. An attitude toward a person, object, or stimulus can be extremely negative to extremely positive, but also conflicted or ambivalent. An attitude towards a stimulus is not always consistent, meaning that at different times both positive and negative attitudes might be expressed toward the same objects (Wood, 2000).

Carl Jung is one psychologist who explored the nature of attitudes and classified them along a single, continuous spectrum with strong polar opposites. In his book, *Psychological Types* (1971), Jung defines extraversion and introversion as the primary attitudes that influence behavior. Extraversion and introversion were defined by Jung as *attitude types*. Extraversion is “an attitude type characterised by concentration of interest on the external object (the outside world)” and introversion is an “attitude-type characterised by orientation in life through subjective psychic contents (focus on one's inner psychic activity)” (p. 414).

Jung’s portrayal of attitudes focused on extraversion and introversion but other models have been developed that characterize attitudes more broadly. As summarized by McGuire (1989), there are seven primary models to describe individual attitudes. These are outlined below:

- 1) Subjects-on-Dimensions Models of Attitude Structure (McGuire, 1981): Attitudes are covert acts that provide some aspect of meaning to some dimension of judgment. Attitudes are dimensional when two or more topics of meaning are distinguished. There can be attitudes towards transcendental topics such as goodness, truth, and beauty, or they can be restricted to physical attributes, such as with judgments on an object's color or mass. The cognitive arena is a multidimensional mental space that is made up of topics of meaning that an individual can make a judgment about or distinguish from another topic. Attitudes are covert thoughts that provide meaning and judgment to a dimension of topics evaluative in nature.
- 2) Subject-Verb-Object Models of Attitude Structure: This is a syntactical approach that treats attitudes as expressions in which a verb specifies a relationship between a subject and an object (McGuire, 1989). Consider the following sentences, "The kind man avoided the intelligent swindler" and "Conservative voters enjoy golf" (Gollob, 1974). In this model, attitudes are expressions of how the verb specifies a relationship between a subject and an object. So in the first sentence, that attitude is expressed through the word "avoided" and in the second sentence, the attitude is expressed through the verb, "enjoy."
- 3) Cognitive-Affective-Conative Models of Attitude Structure: This is a three-part division of attitudes that links the cognitive component of the stereotypes/beliefs one has towards a stimulus, the affective component regarding how an individual likes/dislikes, and the conative component regarding the behavioral tendency to be socially distant or intentional.

- 4) Attribute by Evaluation Models of Attitude Structure: This structure can be formalized in an equation here that defines a certain attitude as being comprised of an individual's subjective probability that the topic has a certain attribute multiplied by his or her evaluation of the attribute.
- 5) Serial Sufficing-Selections Models of Attitude Structure: This describes a simpler model. A judgment is made towards a stimulus quickly and without much cognitive work through a serial processing method. When an individual is, for example, making a decision about what type of cereal they will purchase, they quickly scan through the options and choose the one that they have the most positive attitude towards. The positive attitude is formulated through a few select criteria such as value for nutrition, flavor, and cost. This is coupled with factors that are not valued (e.g. sweetness, brand, organic) that foster a negative attitude towards other cereals. This model expresses how an individual is able to serially process options and make a fast, minimal effort decision.
- 6) Basal-Peripheral Models of Attitude Structure: This model describes the robustness of an attitude system even when it has been influenced to change. An attitude may be secured by an individual and then altered by a relatively small or large force from the external environment. For example, a college student may have a positive attitude towards the study of intelligent design but think less of it when in a biology class that focuses on evolution. However, due to an anchoring effect where the positive attitude towards intelligent design has been nurtured and established throughout their upbringing, when the student has completed the

biology class and the social influence pressure towards evolution is removed, there is a return to the original attitude position.

- 7) Dimensional Models of Attitude Structure: This final model identifies dimensions in which attitudes differ in psychologically important ways. Attitudes may differ because of how they relate to other factors such as meaning or judgment. An attitude can be formulated based on its influence towards unity, which is an aspect of meaning (Katz, 1960), or it can be influenced by its relationship to what is good or truthful, which are aspects of judgment (Hastie & Park, 1986).

As Greenwald (1989) explained, psychologists commonly agree that attitudes are important, but there is still conflict and disagreement over what makes attitudes important. There are various hypotheses for the function for attitudes, such as: they are pervasive so that people are able to make evaluations and distinctions between objects (McGuire, 1989); are useful in predicting behavior (LaPiere, 2010); are forces that guide perceptual and cognitive processes; and are a guide for social function in areas such as social adjustment, object appraisal, and ego-defense (Smith, Bruner, & White, 1956). However, as Orstrom (1989) expressed, these descriptions are unidimensional as well as too diffuse to accurately provide a sufficient, structured framework for narrowly defining attitudes as well as expressing their functional significance. Attitudes should be defined based on their evaluative dimension because this communicates the intuitive appeal and predictions for behavioral reactions. Petty, Briñol, and DeMarree (2007) agree with this focus and describe evaluation as the core notion of attitudes. Ultimately, while the definition, characterization, and function of attitudes are still debated, research recognizes

their invaluable nature to understanding people in various contexts. However, it is still useful to understand their impact in specific settings, such as in the classroom.

In the educational setting, attitudes that students have towards their classes, professors, academic discipline, and/or the institution can impact their overall commitment and achievement. Not surprisingly, one study found that students who had a negative attitude towards science, technology, engineering, or mathematics (STEM) were less likely to engage in their STEM-related classes (Holmegaard, Madsen, & Ulriksen, 2014). Understanding students' attitudes may enable educational professionals to better support recruitment, achievement, and retention.

Interrelationship between Beliefs, Values, and Attitudes

Rokeach (1973) states that a person has as many values as learned beliefs concerning desirable modes of conduct and end-states of existence and as many attitudes as direct or indirect encounters the person has had with specific objects and situations. Therefore, mathematically it is estimated that values number only in the dozens, whereas attitudes are more plentiful, numbering in the thousands. There are overlapping themes that lead researchers to define these constructs along a spectrum where beliefs lead to values, and beliefs and values result in attitudes; but there are also major differences between BVAs which makes them distinct components. To reiterate, beliefs are personal classifications that an individual makes about topics, objects, and dynamics (Meglino & Ravlin, 1998) and values are the attribution of worth to these beliefs, which leads to a hierarchy of desirable goals. Hence, values serve as guiding principles for the individual. Finally, attitudes are defined as the psychological tendency to evaluate a topic, object, or dynamic with a degree of favor or disfavor (Eagly & Chaiken, 1998). They can be

viewed as a culmination of beliefs and values that lead to decisions and behavior. BVAs have overlapping features that impact decision making and behavior depending on the degree of influence.

Belief system theory is one model that has outlined the relationships between BVAs. Belief system theory is a theory of organization that attempts to explain and understand how beliefs, values, attitudes, and behaviors are interrelated and the conditions under which belief systems remain stable or undergo change (Grube, Mayton, & Ball-Rokeach, 1994). In addition to this characterization of the BVA model, a principle within belief system theory known as value self-confrontation (Grube, Mayton, Ball-Rokeach, 1994) tests the robustness of the BVA hierarchy. Value self-confrontation challenges individuals to scrutinize their own and their loved ones' beliefs. This feedback process is expected to anchor the values, attitudes, and behaviors that individuals are passionate about while other BVAs are changed due to self-confrontation.

Some research has concentrated on different aspects of the BVA hierarchy while others have investigated the interrelationship of all three factors. Schwartz and Bilsky (1987) argue that there is an inter-relational structure between values and attitudes and that the impact between the two is best articulated when value systems are used instead of only single values. Dickson (2000) empirically tested the whole interrelationship in a sample of female consumers to understand the hierarchical relationship between BVAs and how they influence purchasing behaviors. It was found that consumers felt more favorable about companies they believed to be socially responsible. Positive attitudes were shaped through past purchase experiences and desire for fashion and most influenced the intention to purchase from socially responsible businesses. The belief that

a company was socially responsible turned consumers' attention towards specific retailers; the positive attitudes of past retailer experience and goal for fashion were more influential on actual purchasing behaviors. Another study by de Groot and Steg (2008) used value orientations to explain how beliefs relate to environmental attitudes and behaviors. The beliefs that one has about the environment were tied to having one or multiple value orientations: egoistic, altruistic, and/or biospheric. An individual's attitudes towards the environment were shaped depending on which of these value orientations were prioritized as being positive and most important. For example, if people believe that the earth exists only for their use, they may have an egoistic value orientation, and feel positively about their use of the environment without regard to green practices such as recycling and conservation. On the contrary, if one believes that he or she should be a steward of the earth, there is a positive attitude towards environmentally friendly activities. This is consistent with the value-belief-norm theory that pro-environmental behaviors arise from acceptance of particular personal values, beliefs that things important to those values are under threat, and beliefs that actions individuals take can help alleviate the threat as well as restore the values (Oreg & Katz-Gerro, 2006).

There are major differences between beliefs, values, and attitudes that make them distinct components but there are also overlapping themes that lead researchers to define BVAs along a spectrum where beliefs lead to values, and beliefs and values amount to attitudes. For example, in the academic environment, the cognitive development of beliefs, values, and attitudes as a collective group may help to better understand and therefore nurture engaged learning, motivation, determination, and achievement.

The provision of overarching as well as domain-specific definitions for beliefs, values, and attitudes has been a difficult task for social scientists. Developing methodologies, metrics, and measures in order to quantify BVAs and empirically study their formation and adaptation has been an even greater scientific challenge. The following section captures progress and gaps in the psychology literature regarding BVA quantification.

Quantifying Beliefs, Values, and Attitudes (BVAs)

Many philosophers and social scientists have focused on articulating the characteristics and influence of beliefs, values, and attitudes, but research is primarily observational and qualitative in nature. It is difficult to quantify BVAs due to their complexity and intertwining nature, which has resulted in limited measurement techniques. On the other hand, this situation has also provided a research niche for social scientists interested in measuring BVAs in various contexts and demographics. Different measures have been developed and used to quantify BVAs and their hierarchical nature with each other. Measures have been used to examine BVAs in many areas but we will continue to focus our attention on the following domains: clinical psychology, cross-cultural research, the corporate workplace, religiosity/spirituality (RS), and academia. Specific measures and their use in each of these domains will now be discussed.

Quantifying beliefs. Suppes (1974) accurately and poetically acknowledges that beliefs “are rather like leaves on a tree [that] tremble and move under even a minor current of information...we shall never predict in detail all of their subtle and evanescent changes” (p. 174). Nevertheless, he provides a theory to measure beliefs utilizing inexact measurement of subjective probability. Five classes of events are proposed: (1) those that

are certain, (2) those that are more likely than not, (3) those that are less likely than not, (4) those that are as likely as not, and (5) those that are impossible. He also proposes the following six axioms as weak qualitative probability structures.

- 1) “*Axiom 1.* X is certain.
- 2) *Axiom 2.* If A implies B and A is certain, then B is certain.
- 3) *Axiom 3.* If A implies B and A is more likely than not, then B is more likely than not.
- 4) *Axiom 4.* If A implies B but B does not imply A and A is as likely as not, then B is more likely than not. [e.g., A fire implies heat, but heat does not imply fire. If a fire is likely to occur, heat is at least likely to occur.]
- 5) *Axiom 5.* If A is certain, then *not* A is impossible.
- 6) *Axiom 6.* If A is more likely than not, then *not* A is less likely than not.” (p. 166, 167).

The following theorems are then concluded from these events and axioms: if A implies B and B is less likely than not, then A is less likely as not; if A is as likely as not, B is as likely as not, and A and B are mutually exclusive, then the disjunction of A or B is certain (p. 167). These situations are more or less descriptive of what a person knows about their own beliefs. From this structure, Suppes goes on to quantitatively argue the measurement structure for beliefs. Although this does not provide a method for precisely measuring beliefs, Suppes states that this approach is similar to that of quantum mechanics and geometry. As in these two fields where abstractions of definite rules lead to specific results, the quantification of beliefs can be based on a specified structure that provides an inexact but numerical measurement.

Clinical psychology. The desire to quantify belief has influenced different areas of research. One example in the clinical psychology realm is the Savoring Beliefs Inventory (SBI; Bryant, 2003). This inventory assesses individuals' perceptions of their ability to experience pleasure from upcoming positive events, by savoring positive moments, and by reminiscing on past positive experiences. People who characterize their beliefs as giving them the ability to avoid and cope with negative outcomes and savor positive ones are more able to demonstrate perceived control (Bryant, 1989). Understanding clients' beliefs about their ability to savor food may enable clinicians to evaluate their clients' strengths and weaknesses in managing positive affect.

Cross-cultural psychology. In the book *Human Beliefs and Values*, edited by Inglehart et al. (2004), research portrays that when comparing over 80 countries there is significant cross-cultural variation in people's beliefs. This book alone is a valuable asset for understanding how social, political, economic, and cultural attitudes vary from one society to the next. It presents tools and results that characterize cultural differences. For example, one finding demonstrates that in Africa, Asia, and Islamic countries, the majority supports the belief that men have more right to a job than women. In contrast, Catholic-dominant parts of Europe and Latin America the belief is supported by 50 percent of the population, and in the U.S., Canada, and Northern Europe less than one in five agree that men have more job rights than women.

Business. The majority of those who work in the U.S. corporate, business enterprise believe in an underlying moral order that fosters integrity, fairness, and solid work ethic. Fryxell (1992) argues that this belief influences worker behavior (e.g., effort to secure rights or resistance to strategy implementation), decisions (e.g., voting

proclivities in union elections), and attitudes (e.g., trust in management). He investigated this by measuring perception towards the grievance system and found workers' perceptions of procedural justice (e.g., how fairness is executed) were a strong predictor of how much a worker believed in workplace morality. Similarly, Otto and Schmidt (2007) investigated the belief of justice for dealing with stress in the workplace. To measure belief in a just world (BJW), they developed a validated measure of compiled items from publicly available measures, such as the Stress-Related Job Analysis (Cronbach's $\alpha = .85$); Work Harassment Scale (Cronbach's $\alpha = .81$); and Job Diagnostic Survey (Cronbach's $\alpha = .81$).

Religiosity/Spirituality. Religion and spirituality are of public interest in part because many people desire to live with greater inner peace and a fuller sense of meaning, direction, and satisfaction in their lives (Miller & Thoresen, 2003). An area that also intrigues researchers is the study of how religious and spiritual beliefs influence worldview and behavior. The Systems of Belief Inventory (SBI-15R) was designed by Holland et al. (1998) to measure religious and spiritual beliefs and practices for studying quality of life research in patients facing life-threatening illnesses. As summarized by Hill and Pargament (2008), a number of psychometrically sound measures are available to assess the extent to which individuals believe in a central, motivating, divine force. They list the following as measures of religion and spirituality constructs:

- *Closeness to God:* Spiritual Support Scale (Maton, 1989); Religious Problem Solving Scale (Pargament, Kennell, Hathaway, Grevengoed, Newman, & Jones, 1988); Spiritual Assessment Inventory (Hall & Edwards, 2002); Index of Core

Spiritual Experiences (Kass, Friedman, Leserman, Zuttermeister, & Benson, 1991).

- *Orienting, Motivating Forces: Age Universal Intrinsic-Extrinsic Scale* (Gorsuch & Venable, 1983); *Religious Internalization Scale* (Ryan, Rigby, & King, 1993).
- *Religious Support: Religious support* (Krause, 1999); *Perceived Support* (Fiala, Bjorck, & Gorsuch, 2002; Hill & Pargament, 2008).

Education. Finally, beliefs are measured in the academic context. Pintrich and de Groot (1990) claimed that beliefs would show themselves to be the most valuable psychological constructs to education. Students' beliefs affect learning and behavior. Bandura, Barbaranelli, Caprara, and Pastorelli (1996) discuss how children's beliefs in their efficacy to regulate their own learning and academic attainments contribute to scholastic achievement through their ability to promote high academic aspirations and prosocial behavior. Teachers' beliefs have also been found to impact their students, specifically their satisfaction, motivation, and achievement (Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Pajares (1992) discusses how college students find themselves in a new, strange context that will one day be linked to their professional environment and therefore must define their surroundings. Acquiring new information and developing new beliefs are gradual enterprises of taking initial steps, accepting, and rejecting certain ideas, modifying existing belief systems, and adopting new beliefs presented by the teachers in the classroom setting. Teachers who are the experts in their discipline and provide the link between the classroom and the professional environment help students to define themselves.

Teachers' beliefs usually refer to schooling, teaching, and learning. Their beliefs about topics beyond their profession, such as politics, abortion, climate change, origin of life, art, and the philosophy of knowledge, are seldom considered even though they certainly influence their practice (Pajares, 1992). Teachers' self-efficacy is one of the few constructs that have validly and reliably been measured in the educational setting. Introduced by Dellinger, Bobbett, Olivier, and Ellett (2008), the Teachers' Efficacy Beliefs System—Self (TEBS-Self) measures teachers' individual beliefs about their own abilities to successfully perform specific teaching and learning-related tasks in their classrooms.

In summary, although incomplete, research has focused on measuring beliefs to understand their influence in a variety of contexts: clinical, cross-cultural, business, religion/spirituality, and education. In the next section, a review of how values have been measured in these same domains is presented.

Quantifying values. The Rokeach Value Survey (RVS) is one popular instrument for measuring values. As discussed earlier (see page 9) terminal values refer to desirable end-states of existence, such as inner harmony, a world of peace, and an exciting life whereas instrumental values are preferred modes of behavior, such as love, cleanliness, forgiveness, and logic. When respondents are given the RVS to complete, they are instructed to first arrange the 18 terminal values and then the 18 instrumental values into an order of importance to them personally, as guiding principles in their own life (Rokeach, 1973). The RVS has been tested for validity as well as used by social scientists across disciplines and cultures. Thompson, Levitov, and Miderhoff (1982) tested the validity of the RVS and found the survey to measure the proposed factor as well as be

situation specific. Munson and Posner (1980) found that the RVS is able to identify values and differentiate between samples of students, parents, businessmen, and members of a general population. The RVS has been used to measure values in clinical psychology (Tjeltveit, 1986), cross-cultural research (Schwartz & Bilsky, 1990), business enterprise (Gibson, Greenwood, & Murphy, 2011; Munson & McQuarrie, 1988), religion and spirituality (Barnes & Brown, 2010; Shoemaker & Bolt, 1977), and academia (Feather, 1975).

The Schwartz Value Survey (SVS; Schwartz, 1992, 2006) and the Portrait Values Questionnaire offer alternative ways of quantifying values (PVQ; Schwartz, 2006; Schwartz, Melech, Lehmann, Burgess, & Harris, 2001). The SVS presents two lists of context-free value items; the first list contains 30 items of desirable end-states and the second contains 27 items that describe desirable behaviors. The stimuli in the PVQ are persons, portrayed in terms of their goals, aspirations, and wishes. The PVQ was developed as an alternative to the SVS to measure the ten basic values in samples of children from ages 11 to 14 years and of persons not educated in Western schools, which emphasize abstract, context-free thinking (Schwartz, 2012)

Clinical psychology. Values have been measured using the RVS and SVS in clinical psychology to investigate the differences in the value systems of more and less effective psychotherapists (Lafferty, Beutler, & Crago, 1989), as well as to measure the extent of perceived changes in patients' values over the course of therapy (Kelly & Strupp, 1992). The latter phenomenon is known as the Value Assimilation Effect (VAE) and will be addressed in a subsequent section.

Cross-cultural psychology. In cross-cultural research, Schwartz and Bilsky (1990) used the RVS in Israeli ($n = 455$) and German ($n = 331$) populations to investigate the importance of 36 Rokeach values as guiding principles in their lives. Currently, the SVS and PVQ are dominant measures for cross-cultural research. Schultz and Zelezny (1998) investigated multinational value differences for environmental damage, personal responsibility, and pro-green decisions. Data were collected from students in Mexico, Nicaragua, Peru, and the U.S. using the SVS.

Business. The U.S. work environment has a diverse makeup of individuals. Gibson, Greenwood, and Murphy (2011) investigated generational differences in personal values using the RVS and found that Baby Boomers are hard-working, resistant to authority, and feel they have earned the right to be in charge. Generation X values independence and self-reliance while Generation Y desires instant gratification, work excitement, and validating feedback. Gibson and colleagues encourage management to maximize productivity and collaboration by taking these factors into account. Munson and McQuarrie (1988) shortened the RVS using a principal components factor analysis with varimax rotation. This revealed three factors that may be used to understand the values that drive specific product purchase: (1) value for products that help to fulfill adult responsibilities (e.g., responsibility, self-control), (2) values for products that fulfill lifestyle goals (e.g., exciting life, comfortable life), and (3) values for products that are perceived to remove tension (e.g., inner harmony, cheerfulness).

Religiosity/Spirituality. Rokeach (1968a) states that regardless of what sociologists and psychologists have said about the function of religion in society, two conclusions can be made about people who have a religious faith: 1) religion teaches man

a distinctive system of moral values that he or she might not otherwise have and, 2) moral values guide a person's everyday relations to his or her associates toward higher, nobler, or more humane levels. The nature of values and differences between religious commitment levels were analyzed in a sample collected by the National Opinion Research Center on 1406 American adults (over 21 years) as well as on a sample of 224 college students taking an introductory psychology course at Michigan State University (Rokeach, 1968a). In the sample of American adults, there was a strong, positive relationship between active churchgoers and their value of salvation. The more active they were in church, the higher they ranked salvation as a terminal value (average ranking = 3) compared to non-churchgoers who ranked it as much lower (average ranking = 18). Churchgoers also ranked the terminal values: a comfortable life, an exciting life, freedom, and pleasure, lower than non-churchgoers. Differences were also found between people with varying levels of religiosity regarding instrumental values. Churchgoers ranked forgiving, helpful, and obedient significantly higher as important values to them compared to non-churchgoers whereas the inverse relationship was found for imaginative, independent, and logical. Among the sample of college students, having freedom and a sense of accomplishment were most valued for those who reported a low perceived importance of religion whereas those who reported a high perceived importance of religion ranked salvation and wisdom as most important values. These findings demonstrate that value differences exist between those who are highly engaged in their religious faith, those who are less religious, and those who are not interested in religion.

A study by Shoemaker and Bolt (1977) investigated the relationship between the RVS and perceived Christian values. Using the RVS, it was found that there was a high degree of agreement in the perception of what Christians should strive for (terminal values of salvation, wisdom, inner harmony, and mature love) and how they should live (instrumental values of love, forgiveness, and honesty). Continuing with research on the impact of religious values, Barnes and Brown (2010) used mediation analyses to investigate how individuals with different levels of religiosity forecasted their willingness to forgive when presented with hypothetical scenarios. The direct effect of religiosity on the Transgression Narrative Test of Forgiveness (TNTF) measure was found to be significant ($\beta = 0.152, p = .002$). The total indirect effect of religiosity on the TNTF through the Attitude toward Forgiveness (ATF) and Tendency to Forgive (TTF) measures was also significant. This supports the notion that religious people differentially reflect on their forgiveness values to forecast their behavior of forgiveness.

Education. In the educational arena, Astin, Astin, and Lindholm (2011) hypothesized that the academic environment is an opportunity for students to make meaning of their education and their lives as well as refine their value system. However, there is an imbalance within universities' focus where more emphasis is directed to "outer" aspects of students' development through course completion, honors and awards, and degree attainment and less towards "inner" development that targets values, beliefs, emotional maturity, moral development, spirituality, and self-understanding (p. 39). College campuses have tended in the past to focus on empirical, positivistic, objective, *value-free* knowledge that does not allow, for example, the spiritual values of faith, hope, and love (Palmer, 2010). Since university educators are first-hand witnesses of their

students' needs to have something coherent to believe in (Nash & Murray, 2010), universities have gradually permitted courses, e.g., positive psychology, that allow for value exploration to play a more significant role in student development (Tierney & Rhoads, 1993).

Although there is a gap in the literature for measuring students' values within their educational context, the Rokeach Value Survey (RVS) and the Schwartz Value Survey (SVS) have been validated in student samples. For example, in a study by McCabe, Dukerich, and Dutton (1991), the RVS was used to compare value differences between 318 business students and 481 law students. Results indicated that law students valued equality, salvation, and wisdom while the business students significantly valued a comfortable life, an exciting life, happiness, and pleasure. This suggests that law students prioritized values around justice and competence and business students valued personal gain above other values. Similarly, Baltakiené (2013) used the SVS to investigate the relationships between 16 – 18 year olds' value orientations and extracurricular activities. Although overall significant relationships were absent, results indicated that students in artistic clubs demonstrated more pro-social values, such as altruism, compared to students involved in sports activities.

Additionally, in a sample of 208 university students, three new value inventories were developed on the basis of the RVS and tested for reliability (Braithwaite & Law, 1985). The Goal Values Inventory, which measured values for personal goals (e.g., a sense of accomplishment), had a median test-retest reliability coefficient of .62. The Mode Values Inventory, which measured how respondents may or may not emulate behavioral patterns, had a median test-retest reliability coefficient of .61. The Social

Values Inventory, which asked students to judge the importance of the societal goals in guiding their personal actions and their judgments about national/international events, had a median test-retest reliability coefficient of .62. Park and Peterson (2006) also developed the Values in Action (VIA) inventory. This validated and reliable self-report questionnaire quantifies six character domains which, in this context, are synonymous with values:

- (1) Wisdom and knowledge – the acquisition and use of knowledge
- (2) Courage – the exercise of will to accomplish goals in the face of external/internal opposition
- (3) Humanity – the tending and befriending of others
- (4) Justice – the civic strengths that underlie healthy community life
- (5) Temperance – the protection against excess
- (6) Transcendence – the connections to something beyond the universe that provide meaning.

Quantifying attitudes. As described earlier, attitudes are primarily defined as an emotional opinion that is positive, neutral, or negative in nature. This characterizes attitudes on a unidimensional scale. Cacioppo and Bernston (1994) argued that in regards to measurement, attitudes and, more importantly, activation of attitudes and their implications should be quantified on a non-linear plane. In order to separate the activation of positive and negative processes, the investigation of their unique antecedents and consequences, and the examination of the psychological and physiological constraints, Cacioppo and Bernston present an alternate bivariate formulation for the measurement of attitudes. They give their conceptualization of an attitude represented by the principles of

evaluative activation, the adversative evaluative actions, and bivalent modes of evaluative activation in the following equation: $Attitude = 0.4(P_i + c) - 0.6N_j + I_{ij}$. In this equation, .4 is a conservative estimate of the weighting factor for positivity, approximated on the basis of the research on approach and avoidance gradients, that reflects the lower weighting for positivity relative to negativity (e.g., negativity bias). The 0.6 value is the corresponding weighting factor for negativity. P is the activation function for positivity and is approximated by the function i ; i represents the level of positivity activated by an attitude object; and c is a constant that contributes to a higher intercept for positivity than negativity since initially, at distances far from the goal, the motivation to approach is higher than the motivation to avoid. N is the activation function for negativity and is approximated by the function j ; j represents the level of negativity activated by an attitude object. I is a function of i and j and represents the summation of error from effects that cannot be measured.

A difficult aspect of measuring attitudes, as well as for beliefs and values, is that there is a reliance on self-report measures and, therefore, an assumption that participants will respond honestly and accurately. In order to mitigate the possible divergence between participants' actual attitudes and what they report on a questionnaire, Greenwald, McGhee, and Schwartz (1998) developed the Implicit Association Test (IAT). The IAT measures implicitly differential associations of two target concepts with an attribute. It has been found to be sensitive to (a) near-universal evaluative differences, (b) expected individual differences in evaluative associations, and (c) consciously disavowed evaluative differences. Greenwald and colleagues propose a theoretical integration of four social cognitive constructs: stereotype, self-concept, attitude, and self-

esteem (Greenwald et al., 2002). The IAT is used, along with self-report measures, to test the model by quantifying participants' attitudes toward self, gender, and academic disciplines,

Clinical psychology. Due to this assumed relationship between attitudes and decision making, clinical psychology research has made use of attitudes in therapy. One example of this is the Eating Attitudes Test (EAT; Garner, Olmsted, Bohr, & Garfinkel, 1982). EAT is a self-report questionnaire designed to capture the attitudes clients with anorexia nervosa have towards eating and weight. The Hopelessness Scale is another measure that has been used to quantify one's attitudes towards future events and has been used to clinically assess and treat clients who are suicidal (Beck, Weissman, Leister, & Trexler, 1974).

Cross-cultural psychology. Attitudes have also been measured to understand the differences across countries and cultures. Weber and Hsee (2006) compared Poland, Germany, the United States, and China to understand cross-cultural differences in attitudes towards perceived risk. Participants completed the Willingness to Pay (WTP) questionnaire, which inquired about individuals' perceptions and reactions to risky financial investment options. The Modernity Scale is another measure developed to capture cultures' attitudes towards being a society that is socially modern and contemporary. Hui, Drasgow, and Change (1983) used the Modernity Scale to compare American and Hispanic attitudes toward modernization and did not detect significant differences. Since the majority of most cited, cross-cultural research originates from Westernized societies, it is important to consider potential measurement biases. Hui and Triandis (1985) request that researchers not assume that all cultures respond to attitude

measures equally but consider how cultures may demonstrate variation in their: definitions of a single concept (e.g., love), interpretations and responses to survey questions, perception and translation of research purposes, and data collection methods.

Business. The business domain attempts to capture employees' attitudes under the assumption that positive attitudes and workplace satisfaction enhance performance (Judge, Thoresen, Bono, & Patton, 2001). Saari and Judge (2004) specifically investigated the causes, and how to measure and influence employee attitudes. Research shows that disposition, culture, and work environment influence worker attitudes. There are two extensively validated and effective tools to measure attitudes: 1) the Job Descriptive Index (JDI; Smith, Kendall, & Hulin, 1969) and the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, & England, 1967). Both of these measures address satisfaction with pay, promotion, coworkers, supervision, and the work itself. These measures have led to greater scientific understanding of employee attitudes and provide great value for research purposes (Saari & Judge, 2004).

Religiosity/Spirituality. The conceptual and empirical work of attitudes has also been applied the psychology of religion domain. In their book, *Measures of Religiosity*, Hill and Hood (1999) review 125 measures of religion and spirituality from 17 different categories, such as beliefs, attitudes, religious orientation, faith development, fundamentalism, attitudes toward death, congregational involvement, and satisfaction. The purpose of approximately 15 of these measures is to directly understand individuals' attitudes toward different religious concepts. The Religious Attitude Scale (Armstrong, Larsen, & Mourer, 1962) was constructed to assess three types of religious response: orthodoxy, conservatism, and liberalism. The Religious Attitude Inventory (Ausubel &

Schpoont, 1957) is designed to measure the intensity of individuals' religious attitude towards God, immortality, religious doctrine, and church. On a 5-point Likert scale (1 – strongly agree, 5 – strongly disagree), participants respond to items such as, “The church has acted as an obstruction to the development of social justice,” and “Belief in God makes life on earth worthwhile” (p. 96). Another measure, the Religious Attitudes Scale (Maranell, 1966), distinguishes eight dimensions of religious attitudes: church orientation, ritualism, altruism, fundamentalism, theism, idealism, superstition, and mysticism. The purpose of these measures is to quantitatively capture the positive, negative, or neutral position one has towards religion/spirituality. Attitude(s) that one has towards religiosity/spirituality reflects on the level of engagement one might have with spiritual faith, both institutionally and intrinsically.

Education. During the 1940s and 50s, research that was investigating the impact of college on students and the educational curriculum was primarily focusing on the effects on student attitudes (Sanford, 1962). This contributed to the development of measurements that would capture students' attitudes during their four to five year undergraduate university experience. In his book *Four Critical Years: Effects of College on Beliefs, Attitudes, and Knowledge*, Astin (1977) analyzed the longitudinal 1967 *Freshman Survey* that was completed by freshmen when they first started college in 1967, again after their first year, and then again in 1971 when students graduated. The Freshman Survey was developed by the 1966 American Council on Education, Cooperative Institutional Research Program (CIRP). The survey captured data from over 200,000 students attending over 300 undergraduate institutions. From the results, Astin observed that attitude change was greater over the four year interval than over the first

year which indicates that change in student attitudes does occur but it is a gradual process that does not occur abruptly when one is exposed to the college environment. Results from the Freshman Survey demonstrated that students become more autonomous, liberal, and open-minded. More specifically, at a large, public university institution, students who were reared in the Protestant or Jewish faith, had parents who were highly educated, or had high educational aspiration showed greater-than-expected increases in positive attitude towards self-autonomy. At private nonsectarian institutions, the Freshman Survey showed that there were greater than average declines in traditional religious preferences and larger-than-average increases in liberalism, interpersonal self-esteem, artistic interests, and intellectual self-esteem.

Attitudes have also been found to be associated with students' academic major (Feldman & Newcomb, 1969). Those majoring in mathematics or natural sciences reported positive attitudes toward their own sense of intellect and interpersonal self-esteem while those studying social sciences had positive attitudes towards interpersonal self-esteem, artistic interests, and liberalism. Engineering students were more the opposite; they had more mathematical and scientific interests and were more conservative.

Newcomb (1943) also investigated how the student community may influence social attitudes. Using the Political and Economic Progressivism (PEP) scale, it was found that significant change in social attitudes (from more to less conservative) occurred between freshman and senior years. Newcomb concluded the community role mediates between social attitudes and other personality characteristics.

Overall, these measurements and findings indicate the measurement of attitudes is a critical area of research and has been applied to clinical psychology, cross-cultural research, business, religiosity/spirituality, and academia. The university setting is an especially influential environment that can significantly and gradually impact students' attitudes during their undergraduate journey.

Quantifying the interrelationship between BVAs. Measures and methods have been developed to quantify beliefs, values, and attitudes in isolation, but due to the intertwined nature of BVAs and their hierarchical relationship, research has also focused on quantifying the interrelationship between BVAs. Statistical analyses are becoming more mature to investigate as well as quantify the interweaving of BVAs. Homer and Kahle (1988) conducted a structural equation test that investigated the relationships for healthy eating between values, attitudes, and behavior. They collected data on nutritional beliefs and the influence on nutrition shopping behaviors. A self-report questionnaire was administered to 831 food shoppers. The questionnaire was a variant of the RVS and contained questions inquiring about attitudes towards nutrition and natural foods. Each respondent also rated Rokeach's list of values (LOV) on a 10-point Likert scale gauging the importance and influence of their values and attitudes on his or her daily life. Data were analyzed using exploratory factor analysis, structural equation modeling, and multivariate analyses to understand the value system framework for nutritional eating and how it influences food purchases. It was found that those who place more importance on internal values took extra care to align their values with their food choices and were less likely to be influenced by retailers that marketed less healthy foods compared to those who were more focused on the external value. The need to have a sense of belonging

(external value) tended to lead individuals to conform to the dominant culture of the shopping context and therefore could influence individuals to purchase unhealthy foods, especially when pressured by the social environment. Values were more strongly associated with attitudes than with behaviors suggesting that attitudes play a mediating role between values and behavior.

In another study, Feldman and Lynch (1988) discussed the complications in quantifying the interrelationship between BVAs. They argue that it is important to quantify BVAs but the timing, order, and method of measurement could alter the correlations between BVAs. When collecting data, if a survey asks participants to respond to an item about an attitude, belief, or value, and the individual is ambivalent towards the topic or never thought about it, the process of responding to the item may influence the participant's response and overall BVA. The newly created attitude may then be used for subsequent items to answer later questions about the same attitude object. To mitigate this so that researchers are more accurately measuring participants' BVAs and not creating them, Feldman and Lynch (1988) suggest five steps:

1. Extensively pretest the subject population through both interviews and behavioral observation to help determine the beliefs, attitudes, and intentions that are spontaneously formed or pre-exist.
2. Determine the jargon naturally used by respondents to express both cognition and affect as well as the ecological form of behavior. This is a standard procedure in cross-cultural research.
3. When employing experimental methods, infer inputs that are dominant in the absence of prior questioning.

4. Conduct field experiments that systematically assess, for example, how well question placement and test form ensure reliability and validity (e.g., establish trait and nomological validity).
5. Determine the extent to which different subgroups of the population differ in susceptibility to measurement effects, e.g., individual differences in prior knowledge and involvement.

As the literature portrays, quantifying BVAs and the relationships they have with each other is a difficult task that often produces noisy data. However, social scientists recognize the importance of studying BVAs' impact and strive to overcome measurement challenges. Researchers have spent considerable amounts of time and effort to understand the differences and intersections as well as to develop quantitative frameworks, methods, and measures to empirically study BVAs. The next section will discuss how researchers have used quantitative measurement to capture how external influences, such as a power differential, may affect individuals' BVAs.

Influences that may Cause BVAs to Change

Individual and social change would be impossible if beliefs, values, and attitudes (BVAs) were completely stable. In the same way, the continuity of human personality and society would be impossible if BVAs were completely unstable. The understanding of BVAs must take into account both their enduring as well as changing character (Rokeach, 1973).

A classic psychology experiment by Lord, Ross, and Lepper (1979) demonstrates potential attitude change. After being assigned to a particular side of an argument, study participants examined the evidence on both sides of a presented issue and were asked to

report which side of the argument had the most compelling evidence. Participants reported that the evidence for the side that they were on was more compelling than the evidence for the other side and that their own attitudes toward the issue had become more partial. Researchers labeled participants' increased partiality towards the side of the topic they were assigned to as the "Biased Assimilation Effect." It can be argued that in this study, the participants were influenced by being in a context that supported one opinion over the other and felt an intrinsic pressure to align with their assigned side to prevent cognitive dissonance, which is the state of having inconsistent beliefs, opinions, values, or attitudes (Wicklund & Brehm, 2013). In addition to these findings, Schuette and Fazio (1995) found that individuals were more likely to experience the biased assimilation effect when attitudes towards the presented topic were highly accessible and the participants were confident about the accuracy of their judgments. This phenomenon has faced criticism. Although subsequent studies have replicated the biased assimilation effect, these were more self-reports of polarization and not a committed attitude change (Miller, McHoskey, Bane, & Dowd, 1993). This suggests that attitudes towards a subject may be influenced on the surface level by context and social expectation but may not demonstrate robust change over time. This leads researchers to further question what could influence a robust change in BVAs.

Cognitive dissonance does support the concept of BVA change. It is argued that cognitive dissonance results from a feeling of personal responsibility for causing an unwanted event or proattitudinal action that fosters negative consequences (Cooper & Fazio, 1984). BVA change occurs when there is a need to alleviate the discomfort and potential conflict that is induced by dissonant beliefs and behavior (Elliot & Devine,

1994). This has been found in regards to changes in religious values and attitudes especially among young adults. When inconsistencies between personal behavior and religious beliefs arise, this generally leads to reduced religious commitments. For example, youth who report that they have engaged in sexual intercourse or risky behaviors (e.g., drugs, alcohol, dares) were more likely to report a negative religious transformation in which they decreased religious attendance and salience (Regnerus, Smith, & Smith, 2004).

This nature of attitude change is especially applicable to the educational context where dissonance may occur during university classroom discussions. As Jonassen and Land (2012) described, learning is a process of meaning-making where students resolve the dissonance between what they believe or desire to be true with new information and experiences. The resolution of the dissonance enables students to be the owners of the classroom content and their BVAs. Other research has shown that while attitudes towards a subject may be influenced on the surface level by context and social expectation, there is not robust change over time (Miller, McHoskey, Bane, & Dowd, 1993). Professors are not typically interested in their students temporarily adapting their BVAs but rather aim to promote a sustainable connection between in-class learning and the greater world.

Visser, Bizer, and Krosnick (2006) found that the psychological significance of a topic influences BVAs to change, but enduring BVA change may be altered through key attributes in the surrounding environment. The presence of a power differential is one factor that has been researched. The presence of a power differential has been described as the level of control one individual or group has over its own fate as well as over other groups (Sachdev & Bourhis, 1991). We will now discuss how a power differential may

influence BVAs and continue to explore the domains of clinical psychology, cross-cultural research, business, and academia.

The Impact of a Power Differential on BVAs

Clinical psychology. In clinical psychology research, a phenomenon entitled the Value Assimilation Effect (VAE) has been detected. It is a common belief in the profession that therapists' personal values should not interfere with therapy, but the question remains, "*Can* therapist values honestly be eliminated from therapy?"

Psychologists have argued that the notion of keeping one's personal values out of therapy is not a feasible option. As Ingham and Love (1954) articulate, if a client and therapist are discussing issues for a period of time in therapy that involve moral values, it is evident that the patient will have a concept of the therapist's personal opinions and values. The therapist's attitudes, whether intentional or not, about right and wrong, or good and bad, are likely to be particularly influential for the patient. Although clinicians in training are often taught to eliminate their values from their interaction with a client, the idea of implicit, unconscious value assimilation argues that value-free therapy is a misconception and unachievable. Researchers such as Rosenthal (1955) as well as Meehl and McClosky (1947) documented that therapists do not remain value-free even when they intend to do so. These findings led to a surge of interest in the 1950s which was again repeated in the 1980s. Strupp (1980) acknowledged that psychotherapy intrinsically involves a real relationship between therapist and client and therefore cannot be understood as a value-free enterprise. The effect, termed, as noted above, the Value Assimilation Effect (VAE), has repeatedly shown striking results. As Figure 1 illustrates, at the beginning of therapy the relationship between therapist and client values was moderately weak both for

terminal values ($r = .33$) and for instrumental values ($r = .36$). However, by the end of therapy, the value congruence, or the relationship between therapist and client values, was very strong (terminal values, $r = .81$; instrumental values, $r = .69$). The magnitude of change is substantial, with an increase in r of .48 for terminal values, and of .36 for instrumental values.

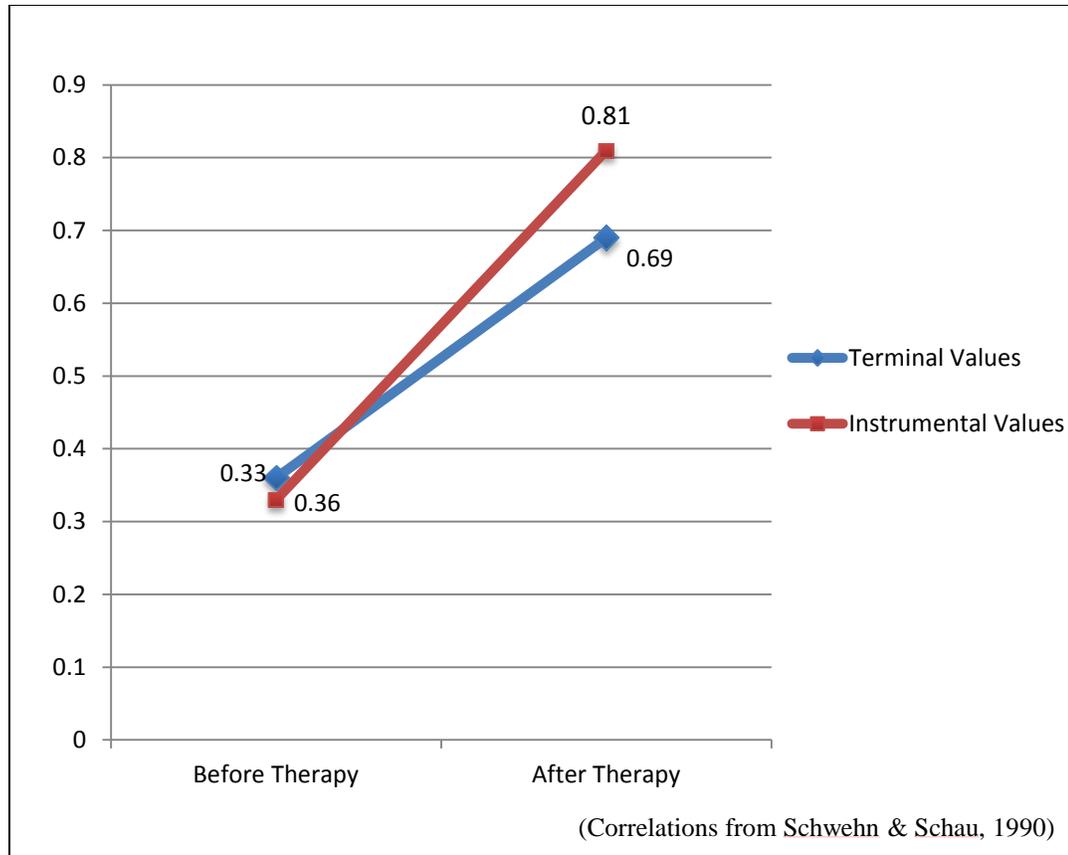


Figure 1. Illustration of the Value Assimilation Effect: Increase in congruence between therapist-client values over the course of therapy.

To investigate this further, numerous research studies have been conducted analyzing the effect on therapist and client values before and after at least six months of therapy. In 1955, Rosenthal found that client values move in the direction of therapist values over the course of successful psychotherapy. Subsequent review of the relevant

empirical research has confirmed these findings (Beutler, 1981; Kessel & McBrearty, 1967; Tjeltveit, 1986). Congruence between therapist and client of both terminal values (e.g., goals such as good family, job promotion) and instrumental values (e.g., personal traits such as honesty, perseverance) was stronger after therapy compared to before.

T.A. Kelly (1990) compiled and analyzed the surge of research from the 1950s and 1980s to better understand the validity of the VAE. Over 100 articles were found to have explicitly examined this effect. Using conservative selection criteria, Kelly narrowed the 100 articles to 10 in order to validate the VAE. Kelly reported significant research findings across all 10 articles. There was a strong relationship between patients' acquisition of therapist values and patients' rating of improvement ($r = .76$). Clients who acquired the values of their therapists also felt more positive about their therapy experience. On the other hand, multiple regression analyses showed that overall rating of improvement was related to the similarity as well as the dissimilarity in therapist-client values ($r = .84$). Those who had dissimilar values were more likely to express dissatisfaction with therapy, ($r = .52$). In the same way, clients who were not improving during the course of therapy began to disagree more with their clinician and tended towards value divergence. Overall, as summarized by Kessel and McBrearty (1967), therapists may unconsciously communicate their value preferences to their clients and clients may in turn respond to this. During the course of therapy, clients are likely to shift their value configurations to more closely resemble those of their therapist. This is especially true in the case of clients who view their clinical experience as being positive versus those who have a negative experience. Value incongruence has a high correlation

with dissatisfaction in therapy. Clients who adopted the clinicians' values were the ones who viewed therapy as a beneficial experience (Tjeltveit, 1986).

The power differential that exists in therapy impacts this direction of value assimilation. Research has found that psychologists are more stable in their values while clients' value systems are less stable and more variable (Schwehn & Schau, 1990). These findings suggest that psychotherapy can be viewed as a process of value stabilization for the client. This is an area of clinical concern because there are major differences between therapist and client populations. Therapists are consulted by individuals for significant reasons including situations of suffering, sexuality, and meaning in life. One example of this is captured by Delaney, Miller, and Bisono (2007). In a survey of a national sample of 258 APA therapists, it was found that American psychologists remain far less religious than the population they serve. Gallup Poll (2011) found that 92 percent of the general population while only 51 percent of therapists reported that they believe in God. Similarly, Bergin and Jensen (1990) stated that psychologists and therapists as a group are particularly set apart by standards that are informed by a scientific *Weltanschauung*, a humanistic orientation, and a liberal political outlook. These findings need to be seriously considered in conjunction with the Value Assimilation Effect. Psychologists on average have personal values that contrast with the value system of their standard client and, through the influence of the power differential, have a high probability of unconsciously transferring these values in therapy without their clients' knowledge or permission.

Cross-cultural research. Power differentials exist across and within various cultures. As history depicts, power in the social environment has led to military coups, wars, and hostile takeovers. People of high power have taken the responsibility to

engineer livelihood, governments, and popular culture in order to maintain and strengthen their power (Overbeck & Park, 2001). Between cultures, one country may have more resources and, as a result, more trading power and financial inflow than other countries that have fewer resources. Within a culture, leaders, political organizations, and those of higher socioeconomic status may have more power and therefore more influence over the population that does not have as much entitlement or affluence. Tajfel and Turner (1986) explained the influence of high-power individuals/groups over low-power people through their Social Identity Theory (SIT). SIT postulates that individuals seek to belong to groups that will generate positive social identity. In order to accomplish this, individuals or groups will adapt their beliefs, values, and attitudes to match those that are more affluent in order to achieve a desired resource such as with wealth, popularity, or influence.

The existence of a power differential has been found to impact how high-power and low-power groups perceive the opposing group (Sachdev & Bourhis, 2006). A study by Gwinn, Judd, and Park (2013) simulated a power differential in a group of undergraduates by labeling participants as either having high or low power. High-power participants attributed fewer uniquely human traits to low-power participants than vice versa, suggesting that higher-power individuals were more likely to have a more negative, dehumanizing attitude towards their fellow students of low-power status. Similarly, Sachdev and Bourhis (1991) found in a sample of undergraduates that those assigned to the high-power group were more discriminatory, felt more comfortable, and were more satisfied compared to those assigned to subordinate groups.

Although the examples presented above highlight the negative and self-perpetuating nature of power, power is an inevitable part of life and can be used to foster good (Overbeck & Park, 2001). Kipnis (1972) discussed how power may both lead to corruption when leaders act out of their own personal gain without considering the needs of the group they are leading but that it can also generate an attitude of responsibility, such as acting in a compassionate manner to serve others. Cartwright and Zander (1968) and Chen, Lee-Chai, and Bargh (2001) found evidence that supported compassionate power. The resulting impact of the power differential, whether it is positive or negative, links back to the BVAs of the person with higher power. An individual who is socially responsible and strives to uphold the beliefs and values held by members of the broader society is attentive to and expresses views in line with prevailing beliefs, values, and norms (Chen et al., 2001)

Business organizations. A power differential also exists in business organizations. Project leads, managers, directors, vice presidents, and CEOs are all examples of individuals placed in authority over employees. Georges and Harris (1998) investigated power effects on performance evaluations and found that as power levels increase evaluations of others become increasingly negative and evaluations of the self become increasingly positive. In regards to leadership, van Quaquebeke, van Knippenberg, and Brodbeck (2011) found that subordinates implicitly compare their leaders with a cognitively represented ideal image of a leader. The ideal image is formulated in terms of how well they feel a leader will guide their attitudes and behavior. Subordinates not only compare their leader to an ideal prototype but also to themselves.

When subordinates' BVAs are similar to their superior's, it is more likely that the employees will be more supportive of management's strategic planning and vision.

Fu et al. (2004) examined the impact of societal cultural values and individual social beliefs on the perceived effectiveness of managerial influence strategies. They found that miscommunication and conflict arises when organizational leadership and team management ignore the cultural values, norms, and attitudes of an organization. Employees are more likely to react negatively to behaviors that deviate from their own norms and standards. Accurate perception is impaired since individuals tend to interpret others' behavior from their own perspective. Performance and collaboration are more likely to increase when the BVAs of management and employees are in alignment. The contrary may happen when the BVAs between management and employees are misaligned. For example, people who believe in a rewards system might perceive assertive influence strategies as overly aggressive which creates tension and increases conflict.

Academia. In the academic environment, a power differential is present between the teacher and the students. As Hurt, Scott, and McCroskey (1978) argue, the teacher's role of power is always present and instills the control and facilitates the communication needed for students to learn in the classroom setting. The instructor's role has a power that entails the responsibility to know people and to be able to elicit performance and growth from them (Overbeck & Park, 2001). McCroskey and Richmond (1983) explained that this power dynamic is critical for the teaching process as it provides the mechanism needed for students to be taught and influenced beyond their current level of

intellect and maturity. A teacher's degree of power in the classroom is expected to lead to some type of change in students' BVAs (McCroskey & Richmond, 1983).

Teachers are able to exhibit different types of power in the classroom. Raven and French (1958) theorized that there are five bases of power: coercive, reward, legitimate, referent, and expert. McCroskey and Richmond (1983) considered each basis of power in the academic setting. With coercive power, a teacher makes it clear that students who do not conform to the information they present will be punished for not conforming. A teacher can use reward power to require students to conform to the information they present but instead of noncompliance being punished, conformity is rewarded. Legitimate power is based on the student's perception that the teacher has the right to make certain demands and requests because of his or her position and title as *teacher*. Referent power is when the teacher leverages the relationship with their student by appealing to the student's desires to identify with and please the teacher as the higher authority. The teacher is given power by the student due to the admiration the student has for him or her. Finally, expert power is when the teacher expects to be regarded as a knowledgeable, proficient professional in their field. The teacher is greatly concerned with influencing their students' cognitive processes so that they believe what the teacher has deemed to be accurate. Teachers often use multiple or even all types of power to engage their students. A teacher may be unaware of how they are using power styles in the classroom, whereas students are able to perceive the power differential through direct and indirect communication. One study asked teachers and students to gauge how much the teacher used each of the five power types (McCroskey & Richmond, 1983). For example, a teacher might rate his or her power types as: 10% coercive, 20% reward, 25% legitimate,

20% referent, 25% expert, for a total of 100%; his or her students are then asked to rate their teacher for each of the five types. It was found that overall both teachers (70.3%) and students (67.1%) see the proportion of power stemming from reward, referent, and expert bases. The findings showed, not that teachers see their own behavior in a positive light while students see it in a negative light, but rather that they both have a generally positive view, but the teacher's view is a bit more positive. This existence of a power differential in the classroom as well as the positive attitude students have towards their teacher's style suggests that students regard their teachers as figures of influential authority. Students feel positively about adapting their knowledge base and worldview with the information provided by their teacher.

A second study investigated if teacher and students' perception of the teacher's use of power was associated with cognitive as well as affective learning (Richmond & McCroskey, 1984). Cognitive learning was defined as college students' ability to learn information across different subjects. Affective learning was described as the positive attitudes students had toward the course, its content, and the instructor, the increased likelihood of engaging in behaviors taught in the class, and taking additional classes in the subject matter. The findings indicated that the communication of power in the classroom has a major association with both cognitive and affective learning. More specifically, the results from this study showed that approximately 30 percent of the variance in cognitive learning and 38 to 69 percent of the variance in affective learning could be predicted by perceptions of power.

Teachers' nature of power has been found to influence students' knowledge base, cognitive abilities, and attitudes. However, the information and perspective that teachers

present to their students can have a positive and/or negative effect. The presence and use of power in the classroom does not guarantee enhanced student learning and could even reduce student learning (Richmond & McCroskey, 1984). The next section will discuss this notion in more detail.

Beliefs, Values, and Attitudes (BVAs) in the Academic Setting

The class environment serves as a regular occasion where students are expected to participate in discussions, process information at a deep, cognitive level, and formulate their own personal reactions. Class may be the only opportunity to engage students and involve them in a rich, communal discussion. Instead of straight lectures and individual assignments, faculty can assign group work and allot time for open discussions. Positive psychology, which pursues scientific understanding and effective interventions to build thriving individuals and communities to nurture genius and talent (Seligman & Csikszentmihalyi, 2000), calls for the university setting to not just be an institution for emerging adults to learn facts and figures, but also an environment where students can and should discuss challenging questions and develop their own worldview. One resource in positive psychology that helps students consider their beliefs, values, and attitudes and how it relates to their identity is the Values in Action (VIA) classification, discussed previously (Park, Peterson, & Seligman, 2004). The VIA classification offers a way to understand the kinds of qualities that may encompass and enhance a life of meaning, purpose, and value. The VIA identifies six overarching virtues: wisdom, courage, humanity, justice, temperance, and transcendence virtues and maps these to three to six different character strengths.

Positive psychologists encourage students to consider their BVAs but also request teachers to create an environment where BVAs are discussed in the classroom. This enables students to think more deeply about their worldview, but the power differential between students and teachers generates a setting where the value assimilation effect may occur. This is especially true among undergraduate college students attending public universities. In his book *Values in Education and Society*, Feather (1975) discusses how people prefer environments that best fit their BVAs and adapt their cognition and/or behavior when discrepancies exist. More specifically, Feather reports on the 1970 Flinders cross-sectional study which asked students to rank their own values and the values of universities they considered for enrollment. It was found that students' own value systems closely resembled the perceived value systems of the school they were enrolled in when compared to the perceived value systems of the universities they rejected. A follow-up study, the 1971 Flinders study, was longitudinal and tracked value change in undergraduates. It was found that after two and a half years in college, undergraduates' values had considerably changed. The following values were given significantly more importance: a world of beauty, mature love, intellect, and forgiveness; the following values were ranked as significantly less important over time: a sense of accomplishment, national security, salvation, ambition, obedience, politeness, and self-control.

It is not clear which aspects of the college environment impact students' change in BVAs. Vreeland and Bidwell (1966) investigated the role of departments and hypothesized that the goals of a department as well as the status of a *professor-as-role-model* accounted for a portion of this change. They found that the intimacy as well as the

frequency of student-faculty interaction affected students' BVAs. The teachers' effect on students is an area that has been greatly under-researched even though undergraduates spend a substantial amount of their academic career in a classroom setting. However, the same ethical concerns that exist in the clinical psychology setting may apply. In Profiles of the American University: Religious Beliefs and Behavior of College Faculty, a large scale survey of U.S. academic faculty ($n = 6,600$), it was found that faculty are religiously diverse with 22 percent reporting as non-religious or atheist and 54 percent reporting as Christian or Catholic while the general public has a much lower non-religious/atheist percentage (11%) and much higher Christian/Catholic percentage (79%; Tobin & Weinberg, 2007). More specifically, math, science, and social science departments are less likely to report belief in God: 28 percent of science and math faculty and 23 percent of humanities and social science faculty reported belief in God. These findings create an ethical concern because, as the authors of this study found, one troubling finding was that when faculty were asked how often they perceive ethnic or religious minority students reluctant to express their views because they might be contrary to those held by faculty, 7 percent of faculty said "very often," 14 percent said "fairly often," and 38 percent said occasionally.

Taking the influence of a power differential and the changing nature of BVAs in undergraduates into consideration, professors may directly nurture BVA change, regardless of the goals and values of the department and institution. The following segment discusses how university professors may consider BVAs in teaching and the potential positive and negative effects on students.

University Professors' Use of BVAs in Teaching

Professors' ways of thinking and understanding are vital components of their practice because they frame the way knowledge and information are conveyed. Teachers may primarily regard their teaching career in one of two ways: for financial inflow, as a means to make a living, or as a moral mission to socialize students and enhance the community (Nespor, 1987). Ernest (1989) argued that all teachers are in a role to transfer knowledge of a specific discipline (e.g., mathematics) to their students. He also stated that beliefs and attitudes positively guide the way professors teach. The more conscious teachers are of their own beliefs and attitudes, the better able they are to integrate these with their teaching practices and create an influential environment.

As already discussed, the type and degree of power teachers exhibit in the classroom are able to positively or negatively influence their students. Power, in the academic context, is defined as "the teacher's ability to influence students to do something they would not have done had they not been influenced" (Kearney, Plax, Richmond, & McCroskey, 1984, p. 725). Research has found that students regard themselves as being influential, powerful agents when they perceive their professors to be powerful instructors (Golish & Olson, 2009). Specifically, students tend to react positively when teachers demonstrate respectful, referent power because they feel as if there is a greater level of communication and understanding integrated into the teacher-student relationship. In contrast, teachers who use coercive power through threats and punishment are more likely to influence students to respond with attitudes of resistance, dissatisfaction, and/or negative affect (Richmond & Roach, 1992). Research has called for teachers to better understand their BVAs as important information to help determine

their curricula and program, but research should also focus on how teachers' BVAs affect student outcomes (Pajares, 1992). Both the potential positive and negative outcomes are presented in the following.

Potential positive effects. The goal of a classroom setting should not be to transfer professors' BVAs to their students. The primary positive effect professors can have on their students' BVAs is to provide a classroom setting where students can openly consider and anchor their own BVAs in relation to their worldview by hearing the opinions of their professors and colleagues. This enables students to actively engage in the formulation of their BVAs and go through an *anchoring process* where beliefs are linked to their specific values or goals (Nelson, 1968). Astin (1977) reported on findings from longitudinal data of approximately 200,000 students and found that through involvement in the classroom, students develop a more positive self-image through stronger interpersonal and intellectual competence. Smith, Vicuña, and Emmanuel (2015) discuss how professors have the opportunity to communicate the importance of meaning in life, having a sense of calling, and a spiritual worldview. Making the transition from high school to college, undergraduates may have never been in a context where they independently considered their own BVAs. Whether college students remain true to the worldview they were reared in or alter their beliefs, the university setting provides students with the atmosphere and community to examine, consider, and dialogue about their beliefs, values, attitudes, faith, and other aspects related to worldview (Hindman, 2002).

Potential negative effects. As in clinical psychology when Rosenthal (1955) as well as Meehl and McClosky (1947) investigated value differences between client and

therapists and found that therapists do not remain value-free even when they intend to do so, professors are also unlikely to keep their own personal BVAs from influencing their teaching practices. The following is a list of terms, as presented in Tjeltveit (1986), that have been used to describe therapists: crypto-missionaries, hidden preachers, secular priesthood, indoctrination and brainwashing, form of persuasion, interpersonal influence, converted/conversion, and convergence. As reported by Astin (1977), undergraduates over time come to report more liberal political views and attitudes towards social issues, less interest in religiousness and altruism, and reduced value towards athletics, business, music, and status. Although these changes may be deemed by some academics to be positive, if they are transferred from professors to students without students' awareness, professors could be labeled with the same list of terms that therapists have been accused of. Teachers could be viewed as exploiting the power differential if students are implicitly, subconsciously acquiring their professors' BVAs.

How BVAs Influence and Lead to Behavior

Research has focused on classifying and quantifying beliefs, values, and attitudes (BVAs) and has accepted the network of variables intricately involved with decision making (e.g., Tversky & Kahneman, 1981). Despite the complexity, social scientists still desire to explain how BVAs account for behavior. For example, Bagozzi (1981) concluded attitudes were influenced by beliefs, values, and intentions and indirectly explained 8 to 22 percent of proximal and 30 to 32 percent of distal behaviors.

Researchers have also developed theories that describe how BVAs influence decision making and behavior. The following section provides highlights of standard theories that describe the relationship between BVAs and planned behavior. Specific attention is

directed to the Behavioral Influence Assessment (BIA) model. The BIA model is a synergy of validated psychological, social, and economic theoretical models which defines how BVAs can be used to anticipate human decision making by individuals and populations.

Standard Theories on Planned Behavior from Social and Health Psychology

Kluckhohn (1951) articulated that values have cognitive, affective, and behavioral components. The cognitive aspect describes a value as a notion of something desirable and the mechanism by which to attain it. The affective aspect is the emotion that accompanies the desire as well as the positive reaction to that which supports the value as well as the negative reaction to that which is against it. Finally, the last component is often the most important to social scientists because it demonstrates that the activation of a value serves as an intervening variable which results in active behaviors. On this basis, Kluckhohn and Strodtbeck (1961) developed the Values Orientation Theory. This theory was presented and tested in various communities ($n = 5$) located in the southwestern part of the United States. Five basic value orientations were studied: human nature, man-nature, time, activity, and relational orientations. They concluded that the prime motivation for behavior is to express oneself, to grow, or to achieve. To express oneself, individuals concentrate on their personal values and do not necessarily give regard to the group. To grow, individuals are motivated to develop and grow in personal abilities. To achieve, motivation is external, emphasizing behaviors that are valued by the self as well as by the group.

The Theory of Reasoned Action (TRA) was proposed by Ajzen and Fishbein (1973). Three constructs: BI – behavioral intention, A – attitude, and SN – subjective

norm, are proposed to influence behavior. Attitude is defined as the sum of beliefs about a particular behavior. Subjective norms capture the influence of one's social environment. Behavioral intention is a function of both attitude and subjective norm. The strength of behavioral intention depends on attitude and subjective norm ($BI = A + SN$) so that the stronger the behavioral intention is, the more likely a person will engage in the actual behavior. Sheppard, Hartwick, and Warshaw (1988) conducted two meta-analyses which validated the TRA. They found that as long as researchers captured data that was within the boundary conditions of the model, the TRA was effective in behavior prediction.

The Theory of Planned Behavior (TPB; Ajzen, 1991) was developed from the TRA model and also posited that one's behavior could be predicted by understanding one's beliefs, attitudes, and subjective norms. In the TPB model, the concept of control is added to the equation. When individuals perceive that they can engage in a behavior with ease due to control over the environment and their own abilities, they are more likely to perform the actual behavior. Therefore, behavior is guided by behavioral intention, which is the summation of behavioral beliefs, normative beliefs, control beliefs, attitude towards the behavior, subjective norm, and perceived behavioral control. The simplest equation of the TPB model is: $BI = (W_1)AB[(b) + (e)] + (W_2)SN[(n) + (m)] + (W_3)PBC[(c) + (p)]$ where BI stands for behavioral intention, AB is attitude toward behavior, (b) is the strength of each belief, (e) is the evaluation of the outcome or attribute, SN is subjective norms, (n) is the strength of each normative belief, (m) is the motivation to comply with the referent, PBC is perceived behavioral control, (c) is the strength of each control

belief, (p) is the perceived power of the control factor, and each W is an empirically derived weight/coefficient (Ajzen, 2002).

Madden, Ellen, and Ajzen (1992) compared the Theory of Reasoned Action and the Theory of Planned Behavior in a sample of 166 undergraduates. They found that the inclusion of perceived behavioral control enhanced the prediction of behavioral intention and behavior. More specifically, as indicated by the TPB, the effects of perceived behavioral control on a target behavior have the most influence when the behavior presents some problem with respect to control. In addition, Montano and Kasprzyk (2008) reported that both TRA and TPB have been used successfully to anticipate and explain a variety of health behaviors and intentions, including smoking, drinking, health services utilization, exercise, sun protection, breastfeeding, substance use, HIV/STD-prevention behaviors and use of contraceptives, mammography, safety helmets, and seatbelts.

The Terror Management Theory (TMT) is another model that explains behavior through BVAs. The main premise of TMT is that humans are intelligent animals and the only species able to grasp the inevitability of death (Becker, 1973). The beliefs and attitudes that individuals have towards death impact the behaviors that they engage in (Greenberg, Solomon, Pyszczynski, 1997). As Jonas and Fritsche (2012) describe, “reminders of one’s own mortality increase people’s attempts to live up to cultural values and, thereby, affect a wide range of human attitudes and behaviors” (p. 28). Solomon, Greenberg, and Pyszczynski (1991) theorized that children believe that the world is good and just which leads them to expect good behaviors to be rewarded and bad behaviors to be punished. However, as individuals mature, they realize the world is not fair and that

death is unavoidable. Depending on the beliefs and attitudes towards life and death, individuals may become anxious or fearful. This impacts their behavior by causing individuals to avoid situations that are risky, to have strong religious beliefs to cope with death, to have a high self-esteem, and to feel a sense of self-preservation (p. 102-103).

The Theory of Reasoned Action, Theory of Planned Behavior, and Terror Management Theory are well-known models that attempt to explain how BVAs lead to decisions and behaviors. Short summaries of these models have been provided to briefly describe the role of BVAs in anticipating and/or explaining behavior. The next section provides an in-depth explanation of yet another theory: the Behavioral Influence Assessment (BIA) model.

The Behavioral Influence Assessment (BIA) Model

The Behavioral Influence Assessment (BIA) model was developed at Sandia National Laboratories and intertwines validated psychological, social, and economic theoretical models to host individual and group models that account for human decision making by individuals and populations (Bernard, 2007, 2008). This is a specific framework representing the relationship between BVAs and behavior and will be explored in further detail. The BIA is represented by the following primary psychological and social theories: cognitive dissonance (Festinger, 1957), elaboration likelihood (Petty & Cacioppo, 1986; Petty & Wegener, 1999), expectancy value (Ajzen & Fishbein, 2008), social learning (Bandura, 1977, 1978; Rotter, 1945, 1966), perceptual control theory (Powers, 1973), and the theory of planned behavior (TPB, Ajzen, 1991). These are briefly described.

Cognitive dissonance theory proposes that a state of tension occurs when a person simultaneously holds two cognitive perspectives such as beliefs, values, or attitudes that are inconsistent or in contrast with one another (Festinger, 1957). This leads to a change in cognitive thought to re-establish internal harmony.

Elaboration likelihood is one perspective of how attitudes are formed and change. There are two methods for processing thoughts (Petty & Cacioppo, 1986; Petty & Wegener, 1998). The first is the *central route*. This involves thoughtful considerations of ideas, beliefs, and arguments, such as, “Is God real?” The second is the *peripheral route*. This does not result in elaborate thinking, but on the contrary, is when an individual is unable or unwilling to engage in thoughtful consideration of a topic because not enough information is presented, it is incomprehensible, or requires too much energy and effort to digest. Researchers state that attitude changes resulting mostly from processing issue-relevant arguments (central route) will show greater temporal persistence, greater prediction of behavior, and greater resistance to counter persuasion than attitude changes that result mostly from peripheral cues (Petty & Cacioppo, 1986).

The Expectancy Value Theory argues that attitudes are derived from one’s beliefs and values. A belief is developed from novel information or modified by new information. A level of value is then assigned to the belief. The attitude is derived when an expectation is created or modified based on the result of a calculation based on beliefs and values. The central equation of the theory can be presented as follows: $B \sim BI = [A_{act}]_{\omega_0} + [NB(Mc)]_{\omega_1 \dots}$, where “B = overt behavior; BI = behavioral intention; Aact = attitude toward the act; NB = normative belief; Mc = motivation to comply with the

normative belief; and ω_0 and ω_1 are empirically determined weights” (Ajzen & Fishbein, 1973, p. 42).

For social learning, Rotter (1945, 1966) states that the expected effect or outcome of a behavior has an impact on the motivation of people to engage in that behavior. The expectation, whether positive or negative, is not only influenced by internal psychological principles but also by social and environmental context. Bandura (1977) added to this by presenting research that demonstrated that people learn from one another, via observation, imitation, and modeling.

Powers (1973) initiated the Perceptual Control Theory (PCT), stating that purposeful behavior implies control. He compared biological behavior to engineered systems and concluded that control is an input to behavior that can affect the nature of the output. He labeled control and overall input towards behavior as *perception* since they are consciously perceived aspects of the environment.

Finally, as described earlier on page 60, the Theory of Planned Behavior articulates that the individual’s behavioral intentions and behaviors are shaped through attitudes, subjective norms, and perceived behavioral control.

The primary principles associated with each of the described theories are interwoven to form the BIA model. The BIA framework asserts that individuals and the environment emit signals to individuals that may be perceived as cues. These cues may stimulate a particular belief, which in turn may impact values, attitudes, and perceptions of behavioral control. Depending on the nature of the emotion involved, positive or negative, the stimuli may result in the performance of some type of behavior. The actual behavior that is realized is a function of the level of intent, associated affect, and external

stimuli indicating that behavior is actionable. Differences in the cognitive structure of individual beliefs exist so that stimuli are interpreted differently. This leads to individual variation in decisions and behavior. An individual's history of behaviors is also a factor that determines individual decision making: behaviors that have been conducted in the past are more likely to occur in the future.

Values in the Academic Setting

Returning to the academic setting, the university environment is another context where value change is expected to occur to some degree but the extent of the change has not been fully explored. Although university students are expected to refine their values as they become more autonomous and independent, the role of the academic institution is complicated. In some ways, students anticipate an education where they learn about a variety of subjects in novel and diverse ways, which then enables them to reflect on their personal worldview. In other ways, students who choose to attend public, secular universities versus a private, values-based institution likely do not expect their values on spiritual, political, and other personal worldviews to be directly impacted. This creates a scenario similar to the clinical, therapeutic relationship. Students, similar to clients, may be in a class to discuss a specific subject, but through the course of the semester they become aware of their professor's beliefs and values. Since the professor is in a place of authority and may be both appreciated and respected by the individuals in their class, students may choose to align their overall set of beliefs and values to their professors.

This change in values could happen consciously or subconsciously. As characterized by Fanelli (2010), when 222 scholars rated their perception of academic disciplines, results showed a clustering along three main dimensions: hard versus soft

science, pure versus applied (the orientation of the discipline towards practical application), and life versus non-life (the context of the material presented in the discipline). Different expectations are associated with each of these categories. Specifically with the hard versus soft science category, but also applicable to the others, students may perceive their classes to be based on facts and formulas and void of values-based content. Using William Perry's model of student development, the authors of Student Development in College: Theory, Research, and Practice discuss how teachers may see their role as teaching subject matter and strict content versus teaching and impacting students' development (Evans, Forney, & Guido-Dibrito, 2010, p.131). On the other hand, professors may be directly invested in their students' college development and aim to influence BVAs. Therefore, it is important for both professors and students to be aware of how BVAs are impacted in the classroom setting. This brings us to the focus of the current study.

The Current Study

Leveraging the established literature and methodologies in the area of beliefs, values, and attitudes, this research study examined if BVAs of university students were influenced over a semester by the students' attributes, the professor, and the classroom environment. The overall aim was to quantitatively demonstrate that university students do experience a change in their BVAs over a semester period and that they are influenced by their own initial values (their starting point), the nature of the class, and the BVAs of their professor. This study specifically tested the following three hypotheses:

- 1) Students will demonstrate BVA change over time while professors' BVAs will remain relatively stable over time.

- 2) Students' attributes will influence BVA change. It was expected that students who were younger (under 21); had less college experience; reported a weak adherence to values at the start of the semester; or had little to no religious commitment would report higher levels of BVA change compared to their counterparts.
- 3) Students, especially those who have a positive experience in the class, may assimilate to professors' BVAs

As with the clinical psychology findings of the Value Assimilation Effect, it was expected that students' BVAs would demonstrate more flexibility than professors; that students' attributes would determine the amount of BVA change; and that students, especially those who like the class, will show higher levels of assimilation than their peers. The findings of the current study aim to add to the body of literature and provide further insight to what influences students' BVAs, how professors may foster change, and how the classroom setting may influence decision making and behavior.

Chapter 2

Method

To investigate the presence of value change in the academic setting, professors and students nested in classrooms completed a self-report questionnaire on values and their classroom experience. Professors and students at The University of New Mexico (UNM), a public university located in Albuquerque, New Mexico, filled out the questionnaire during the first week of the semester and then again at the end of the semester. Data were analyzed to examine if participants' values changed over the semester and, if so, what factors contributed to the change.

Participants

Only professors who agreed to be a part of this study and signed the permission form and their students of 18 years of age or older enrolled at UNM were permitted to participate in this study. Fourteen professors agreed to be in the study and offered one to two of their classes for data collection. The course, department, class size, and number of students who provided data for both rounds of data collection are listed in Table 1.

Procedure

UNM professors from various departments were contacted via email describing the nature of this study. Professors from two types of departments were contacted: 1) departments that have courses which discuss value-based topics were contacted including the Honors College, Psychology, and Education, and 2) departments that have courses which focus on facts and formulas, such as Computer Science, Statistics and Mathematics, Earth and Planetary Science, and Environmental Science. Follow up meetings were then had with each interested professor to describe the study and obtain permission to collect data from his or her class(es). Professors who agreed to participate in this research signed a non-binding permission form permitting data collection in their

classrooms twice in the semester. Data collection occurred during the first and last week of the school semester. Research assistants visited the classrooms during the first week of class, introduced the study, and obtained consent from all participants willing to complete the questionnaire. All students were informed that their participation was voluntary, that their responses were anonymous, and that they could withdraw from the study at any time. Students who did not wish to participate had the option of completing an alternate task such as a word search puzzle. They were also able to withdraw from the study while completing the questionnaire by writing “withdraw” on the questionnaire coversheet. The questionnaire took approximately 25 minutes to complete. Research assistants then revisited the same classrooms at the end of the semester and had professors and students fill out the same questionnaire they filled out during the first week of class. Students who wanted to participate during the second wave of data collection but did not complete the first questionnaire were permitted to fill out the second questionnaire once they signed the consent form.

The first page of each questionnaire, the “cover sheet,” asked for the participant’s name, email, and school identification number. It also had a unique packet identification number in the top left hand corner. Participants were asked for this information to match individual data collected from the first and last week of the semester. The second page of each questionnaire had the unique packet ID number on it. Students were told that their data would be protected, their questionnaires would be anonymous, their information would only be accessed by approved researchers of this study, and their responses would never be shared with their professors or departments. Similarly, professors were told that their data would never be shared with their students or administrators, and only accessed

by the researcher(s). The cover sheets were removed from the questionnaires once they were completed to anonymize the questionnaires. After professors and students completed the questionnaires to their satisfaction, the questionnaires were collected by the researchers. The cover page with the name and ID was removed and put in a separate envelope to ensure that the data could not be linked to the participant's name except during data entry. Consent forms were collected and placed in a separate envelope. Both envelopes were sealed before exiting the classroom and reopened in the researcher(s)' lab for data entry. All questionnaires were locked and stored in the principal investigator's psychology lab located in Logan Hall, room B60H.

Measures

Professors and students were asked to complete a questionnaire packet on beliefs, values, attitudes, and their impressions of the classroom setting. The questionnaire was 15 pages long and took approximately 25 minutes to complete. Professors and students were given almost identical questionnaires. The only differences between the two questionnaires were the first and last page. The first page (after the coversheet) asked about attributes of being a professor (e.g., teaching topic, years of teaching) or of being a student (e.g., academic major, year in school). Professors self-assessed their own teaching ability using the TEB-Scale whereas students assessed their professor's teaching ability using the same scale. Both questionnaires are attached as Appendix A (Professor Questionnaire) and Appendix B (Student Questionnaire).

As described earlier, past research has developed validated and reliable measures that measure values and classroom experience and are available in the public domain.

Such measures were utilized in this study. The measures that comprised the questionnaire are described below.

Demographics. The first page of the professors' questionnaire asked for responses on gender, age, years teaching, the topic(s) they are teaching, religious and political preference. The cover page of the students' questionnaire asked for responses on gender, age, type of student [undergraduate or graduate], year in school, academic major, religious and political preference.

Rokeach Value Survey (RVS). The Rokeach Value Survey (RVS) is a well-known instrument for measuring values (see page 27). The RVS measures 18 terminal values and 18 instrumental values. Terminal values refer to desirable end-states of existence, such as inner harmony, a world of peace, and an exciting life whereas instrumental values are preferred modes of behavior, such as love, cleanliness, forgiveness, and logic. When respondents are given the RVS to complete, they are instructed to first rank the 18 terminal values and then the 18 instrumental values from 1 to 18 into an order "of importance to YOU, as guiding principles in YOUR life" (Rokeach, 1973, p. 27). The RVS has been tested for validity as well as used by social scientists across disciplines and cultures.

Goal, Social, and Mode Values Inventories. Braithwaite and Law (1985) developed three value inventories based on the RVS and tested them for reliability in a sample of 208 university students. The Goal Values Inventory measures values for personal goals (e.g., a sense of accomplishment) and is combined with the Social Values Inventory which asks students to judge the importance of societal goals in guiding their personal actions and judgments about national and international events. Together they are

called the GSVI. The subscales in the GSVI are based on the terminal values found in the Rokeach Value Survey and focus on measuring values with desirable end-states. The subscales for the GSVI are: International Harmony and Equality, National Strength and Order, Traditional Religiosity, Personal Growth and Inner Harmony, Physical Well-being, Secure and Satisfying Interpersonal Relationships, Social Standing, Social Stimulation, and Individual Rights. The Mode Values Inventory (MVI) contains items that look at how respondents may or may not emulate behavioral patterns. The authors again based the subscales on Rokeach Value Survey, this time on the instrumental values, so that the MVI examines preferable modes of behavior. The subscales for the MVI are: Positive Orientation to Others, Competence and Effectiveness, Propriety in Dress and Manners, Religious Commitment, Assertiveness, Withdrawal from Others, Carefreeness, Honesty, Thriftiness, and Getting Ahead. Thus, the GSVI may be viewed as an assessment of terminal values and the MVI as an assessment of instrumental values. The GSVI has a median test-retest reliability coefficient of .62. The MVI has a median test-retest reliability coefficient of .61. The GSVI and MVI have been used in the university setting to better understand the role that moral emotions play in the psychological health of university students by asking participating students to focus on the level of congruence or incongruence between their personal moral commitments and their behaviors (Hall, Gow, and Penn, 2011).

Values-in-Action (VIA). Park and Peterson (2006) also developed the Values-in-Action (VIA) inventory (see page 33). The Values in Action classification, a validated and reliable self-report questionnaire, offers a way to understand the kinds of qualities that may encompass and enhance a life of meaning, purpose, and value. As described

earlier, the VIA identifies six overarching virtues: wisdom, courage, humanity, justice, temperance, and transcendence virtues. The following presents the definition for each virtue: (1) Wisdom and knowledge – the acquisition and use of knowledge; (2) Courage – the exercise of will to accomplish goals in the face of external/internal opposition; (3) Humanity – the tending and befriending of others; (4) Justice – the civic strengths that underlie healthy community life; (5) Temperance – the protection against excess; (6) Transcendence – the connections to the larger universe that provide meaning.

Teachers' Efficacy Beliefs System—Self (TEBS-Self). Teachers' self-efficacy is one of the few constructs that has been validated as well as reliably used in the educational setting. Introduced by Dellinger, Bobbett, Olivier, and Ellett (2008), the Teachers' Efficacy Beliefs System—Self (TEBS-Self) is a 31-item questionnaire that asks students to rate their beliefs about their teachers' abilities and asks professors to rank their own abilities to successfully perform specific teaching and learning-related tasks in their classrooms.

Consent, Risks, and Benefits

Participants were advised that there were no known risks in this study, but some individuals may experience fatigue, boredom, or mild discomfort when answering questions. One risk was that after an extended period of fatigue, boredom, or mild discomfort participants may withdraw from the study. Participants were told during the consent process that their responses were anonymized and that they could withdraw from the study at any time.

There was no direct benefit to individuals for their participation in this study. They were told that they were assisting the researchers in data collection and the analyses of this data contributed to a greater body of knowledge in psychological research.

Data Management

Once the questionnaires were completed they were taken back to the lab for data entry and analyses. The envelope containing the questionnaire coversheets were sealed when they were taken out of the classroom. The envelopes were opened and the names, emails, and ID numbers entered into an IBM SPSS 22.0 database. The first set of questionnaire responses were entered into the database by the researchers, matching the coversheet ID number to the questionnaire ID number. The second questionnaire responses were entered by first matching the coversheet ID number to the questionnaire ID number, and then by matching the participant's name on the coversheet to their name in the SPSS database. Once all data had been entered for both Time 1 and Time 2, the column containing the participants' names was deleted. This ensured that the database did not contain any personally identifiable information. The coversheets were destroyed after data entry had been completed.

Data Analyses

This study gathered data from 20 classrooms with class sizes ranging from 10 to 200 students. Fourteen professors agreed to be in this study and each offered 1 to 2 classes for data collection.

Statistical analyses using IBM SPSS 22.0 were used to test each hypothesis. Before analyses were conducted, data were screened for accuracy of data entry as well as missing and erroneous data. Participants who did not complete the questionnaire twice

were not used in the final analyses investigating value change. Data were also checked for assumptions of normality of distributions, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates. Each hypothesis and its respective mode of analysis are described below.

Hypothesis 1: Overall, students will demonstrate BVA change over time while professors' BVAs will remain relatively stable over time. For this analysis, BVA scores reported on the first questionnaire were compared with the BVA scores reported on the second questionnaire. The comparison was made using the subscales of three measures: the Goal and Social Values Inventories (GSVI), The Mode Values Inventories (MVI), and the Values in Action (VIA). An average score was calculated for each subscale. Analyses tested if there was a significant change in the mean for each subscale from Time 1 to Time 2 among professors and students, using a False Discovery Rate correction to control for experimentwise alpha (Maxwell & Delaney, 2004).

A within-subjects analysis was conducted to test if the professors' and students' BVAs changed over time. Professor and student data were initially analyzed separately. For students, a between x within design was used to account for students being nested in classes. The different classes constituted levels of a random between-subject factor nested within the levels of a fixed between-subject factor of type of class (values-based or non-values based) and time was used as the within-subject factor. For professors, a within subjects design was used, ignoring class as the between-subject factor since there was only one professor per class. It was expected that in the student data the main effect of time would be significant, but that it would not be significant for the professors' data. Because of the widely varying sample sizes of the two groups, there would be

considerably less power to detect change in the professors than to detect change in the students; thus, estimates of effect size were also computed, anticipating that student's effect size would be larger than that of the professors.

It was also expected that classes would be heterogeneous. To quantify this, the intraclass correlation coefficient was calculated to understand how much of the observed variance was due to class differences. It was expected that there would be differences between classes; however, to allow a direct test of the significance of the difference in change across time in professors as opposed to students, a follow up analysis was conducted ignoring the factor of class. That is, in a between x within design where the between-subject factor was participant type (professor or student) and the within-subject factor was time, the interaction between participant type and time was explicitly tested.

Hypothesis 2: Students' attributes will influence BVA change. It is expected that students who are younger (under 21); have less college experience (freshman/sophomore; undergraduates); report a weak adherence to values at the start of the semester; or have little to no religious commitment will report higher levels of BVA change compared to their counterparts. A filter was applied so that analyses were only run on student participants. Separate analyses were conducted for each student attribute: age, student status (1st year, 2nd year, etc.), commitment to values at the beginning of the semester, and religious commitment. Commitment to values was calculated as single variables by taking the average score of every GSVI, MVI, and VIA subscale at Time 1. Higher scores indicated stronger levels of BVA commitment. Religious commitment was measured using the GSVI "Traditional Religiosity" subscale. Bivariate correlations and multiple regression analyses were used to examine each

student attribute as a predictor of high or low BVA change. Level of BVA change was calculated for each participant by subtracting the average score at Time 1 from the average score at Time 2 for each subscale.

Hypothesis 3: Students assimilate to their professor's BVAs. To examine value assimilation, the RVS ranking scores for instrumental and terminal values at Time 1 and 2 for professors and each of their students were used. Each student's RVS ranked value position was noted separately for the 18 terminal and for the 18 instrumental values, for pre and post. These value ranks were then correlated with the professor's ranking. Thus, four correlations were computed for each student with their professor's values: 1) correlations of their instrumental values with their professor's at the beginning of the semester, 2) correlations of their instrumental values with their professor's at the end of the semester, 3) correlations of their terminal values with their professor's at the beginning of the semester, and 4) correlations of their terminal values with their professor's at the end of the semester. It was hypothesized that mean correlations would increase significantly over time, that is, the main effect of time would be significant in a between x within ANOVA of the correlations. Correlations were transformed using Fisher's r to z transformation before analysis.

To investigate if professors' confidence in their teaching or students' confidence in their professor influenced value change, professors and students were split into categories based on the Teacher Self-Efficacy Beliefs Scale (TEBS). Professors who scored above the median on the Teacher Self-Efficacy Beliefs Scale (TEBS) were labeled as having a "strong positive belief" towards their teaching capabilities. Professors who had below the median on the TEBS were labeled as having a "less positive belief"

towards their teaching capabilities. In a between [class] x within [time] subjects design, professors' self-efficacy was used as an additional blocking variable.

Students were divided into two groups based on their responses to the TEBS. Students who believed their professor had a strong capability in teaching (above the median of all students' ratings) were assigned to the group "high confidence in professor." Students who scored less than the median were assigned to the group, "weak confidence in professor." In a between [class] x within [time] subjects design, confidence in professor was then used as an additional blocking variable.

In addition, to further test this hypothesis, a multivariate analysis was used to examine the difference between professors' and students' BVAs. Profile analyses were conducted for each of the three instruments, analyzing the difference in subscale scores between professors and students at Time 1 and comparing that with the difference between professors' and students' scores at Time 2.

Correlation analyses were also used to investigate the relationship between professors' and students' individual values.

Chapter 3

Results

Statistical analyses were conducted to evaluate the data collected from professors and students in classrooms and test if value change and assimilation occurred. Analyses for each hypothesis were performed using IBM SPSS 22.0. Before analyses were conducted, data were screened for missing and erroneous data. Participants who did not complete the questionnaire twice were not used in analyses that looked at change over time. Data were also checked for missing data, assumptions of normality of distributions, homogeneity of variance, and multicollinearity. These analyses are presented below.

Participants

At the start of the semester during the first week of classes, 688 participants completed the questionnaire. The sample consisted of 14 professors and 674 students. Table 1 presents the courses, departments, class size, and the number of unique individuals who completed the questionnaire for both Time 1 and Time 2. At the end of the semester during the last week of classes, 550 participants completed the questionnaire. The sample consisted of 14 professors and 536 students. Each student who completed the questionnaire both the first week of the semester (“Time 1”) and the last week of the semester (“Time 2”) had their data matched in the final dataset. From the approximately 700 unique participants who completed the questionnaire, 14 professors and 414 student participants had data collected from both the start and end of the semester. Independent groups *t* tests were conducted to examine if there were significant differences in GSVI, MVI, and subscale means between participants who completed the questionnaire in both Time 1 and Time 2 and participants who did not complete the study at Time 2. There were no detected significant differences for the majority of the subscales. However, for the GSVI, the two groups were found to significantly differ for

Social Standing [$t(671) = -2.306, p = .021, \text{Cohen's } d = -.182$], and for Social Stimulation [$t(669) = -2.626, p = .009, \text{Cohen's } d = -.210$]. For both subscales, those who did not complete the study had higher means ($M_{\text{Standing}} = 3.275, M_{\text{Stimulation}} = 3.979$) than those who completed the study ($M_{\text{Standing}} = 3.123, M_{\text{Stimulation}} = 3.814$). For the MVI subscales, similar results were found for Carefreeness. Those who did not complete the study had a significantly higher mean than those who did complete the study, $M = 3.252, M = 3.109$, respectively, $t(665) = -2.324, p = .020, \text{Cohen's } d = -.183$.

Table 1. Course title, department, class size, and number of participants for each class that participated in this study.

Values-based Classes				
Professor	Department	Course Title	Class Size	# Students for T1 & T2
1	Honors College	UHON201: Society & Culture: College Athletics	20	10
2	Honors College	UHON401: Solutions to Human Rights	20	9
3	Honors College	UHON301: Sigmund Freud Debates C. S. Lewis	18	16
4a	Honors College	UHON121.017: Legacy of Classical World	10	8
4b	Honors College	UHON121.028: Legacy of Literature Media	22	5
5a	Honors College	UHON121: Dissent & Democracy	20	11
5b	Honors College	UHON301: Hidden Histories	15	10
6a	Psychology	PSY450: Belief in Weird Things	25	13
6b	Psychology	PSY265: Cognitive Psychology	135	56
7	Education	NUTR321: Management in Dietetics	35	4
8	Psychology	PSY454: Positive Psychology	200	91
9	Education	NUTR320: Methods in Nutrition Education	40	27
Total Number of Students			560	260

*unable to classify students' course for 9 participants

Non-values Based Classes				
Professor	Department	Course Title	Class Size	# Students for T1 & T2
10a	Math & Statistics	STAT427: Advanced Data Analysis	100	35
10b	Math & Statistics	STAT579: Response Surface	15	5
11a	Environmental Science	ENVS101: Blue Planet	115	19
11b	Earth & Planetary	EPS485: Soil Stratigraphy Morphology	15	12
12	Earth & Planetary	EPS201: Earth History	52	34
13a	Math & Statistics	STAT440/540: Regression Analysis	35	11
13b	Math & Statistics	STAT461/561/Math441: Probability	45	9
14	Computer Science	CS341: Intro to Computer Architecture	47	19
Total Number of Students			424	144

*unable to classify students' course for 9 participants

In the sample of professors ($n = 14$), 9 (64%) were male; the average age was 51 years with the youngest professor being 31 years and the oldest being 66 years. Ethnic variety was limited: 12 of the 14 professors were Caucasian (86%), one was Hispanic, and one was European. There was higher diversity in religious status: two professors (14%) reported no religious beliefs, five (36%) reported being Atheist or Agnostic, five (36%) were Protestant, one (7%) was Catholic, and one (7%) was Jewish.

In the sample of students ($n = 414$), 39% were male; the average age was 23 years, with ages ranging from 18 to 66 years. Eighty eight percent of the sample reported they were undergraduate level students. The majority of the sample reported their ethnicity as Caucasian (48%) or Hispanic (32%) with smaller percentages being Asian (5%), Native American (3%), African American (2%), Middle Eastern (1%), or “Mixed/Other” (6%). Students also reported their religious status: 23% were Protestant, 22% were “none”, 17% were Atheist or Agnostic, 20% were Catholic, 7% were Spiritual, 2% were Buddhist or Hindu, and 1% was Muslim.

Different categories were established to analyze the data. Data were first categorized by department. Seven academic departments were represented in the sample: the Honors College (17%), Psychology (39%), Education (7%), Computer Science (5%), Math & Statistics (16%), Earth & Planetary (12%, EPS), and Environmental Science (4%, ENVS). Another category was “class type.” Participants were classified as being either in a class that was “values-based,” meaning that the purpose of the course was to discuss value-based topics (e.g., human rights, spiritual beliefs), or a class that was non-values based, meaning that the purpose of the course was to learn a defined set of information (e.g., formulas, facts, methods). The Honors College, Psychology, and

Education courses were categorized as “values-based” and the Computer Science, Math & Statistics, EPS, and ENVIS were categorized as “non-values based.” From the sample of 414 participants, 63% of students were in values-based classes, 37% were in non-values based. Finally, since data were collected from multiple classes taught by the same professor, data were categorized by course code. There were 20 different courses represented in this dataset.

Data Screening

Participants were instructed to complete the subscales for the Rokeach Value Survey (RVS), Goals, Social, Values Inventories (GSVI), Modes Values Inventory (MVI), Values in Action (VIA), and Teacher Efficacy Beliefs Scales (TEBS) measures. The means, standard deviations, and skewness and kurtosis values for the GSVI, MVI, and TEBS are presented for Time 1 and Time 2 for professors in Table 2 and for students in Table 3. The GSVI and MVI were scored using SPSS by the principal investigator and were screened for missing data. During both Time 1 and Time 2, missing data was found for 14 to 17 students who chose to not respond to one or a few of the requested measures. One class, NUTR321, had a very limited number of students with both Time 1 and Time 2 data and was excluded from analyses investigating between class differences. The VIA scores were submitted to its host institution, the *VIA Institute on Character*, and are only analyzed in Hypothesis 1. Also, the RVS was used in the analyses for Hypothesis 3 and will be discussed in its respective section.

Data were entered by a team of research assistants. To ensure accuracy of data entry, after all the data were entered for Time 1, the principal investigator (PI) double checked the entry of the demographic data and RVS entry for each questionnaire. The PI

then took a sample of at least 30 questionnaires from the set of data entered by each research assistant. Since there were four research assistants who entered data, a minimum of 120 questionnaires from Time 1 and then again for Time 2 were re-entered. The correlation was then calculated between the first and second entry of data. A correlation of 1.0 would indicate that the first and second entry of data perfectly matched and indicated accuracy. It was decided prior to data entry that if a research assistant had an error rate of 1% or greater all the questionnaires they entered would need to be re-entered. The range of accuracy for the four participants ranged from 99.3% to 99.9%. The average error rate for all four research assistants was .003%.

Assumptions of normality of distributions, homogeneity of variance, and multicollinearity were checked. As shown in Table 2, two of the professors' subscales suggested skewness levels above 1.0, indicating some deviation from normality of distribution: International Harmony & Equality (-2.261 at Time 1, -1.378 at Time 2), and Positive Orientation towards Others (-1.028 at Time 2). From Table 3, two of the students' subscales had skewness levels above 1.0: Personal Growth & Inner Harmony (-1.113 at Time 1, -1.051 at Time 2) and Secure & Satisfying Relationships (-1.112 at Time 1, -1.290 at Time 2). Homogeneity of variance was assumed considering that all the scales had reasonable standard deviations. Multicollinearity was also checked for. The absolute value of subscale correlations ranged from .003 to .66, therefore multicollinearity did not appear to be a concern.

Table 2. Professors' mean, standard deviation, skewness, and kurtosis for questionnaire measures' subscales.

Time 1	Mean	Std. Deviation	Skewness	Kurtosis
GSVI Overall	3.739	.297	.120	-1.153
International Harmony & Equality	4.171	.835	-2.261	5.898
National Strength & Order	3.411	.858	.820	-.794
Traditional Religiosity	2.946	1.097	.174	-1.101
Personal Growth & Inner Harmony	4.417	.470	-.767	.814
Physical Well-being	4.071	.557	.758	-.194
Secure & Satisfying Interpersonal Relationships	4.086	.650	-.527	.165
Social Standing	3.214	.564	.436	-.318
Social Stimulation	3.536	.720	.398	-.122
Individual Rights	3.798	.614	-.868	1.132
MVI Overall	3.588	.244	.969	.912
Positive Orientation to Others	4.154	.517	-.820	1.484
Competence & Effectiveness	4.137	.606	-.437	-1.021
Proprietary in Dress & Manners	3.643	.611	-.755	-.555
Religious Commitment	3.429	.885	.069	-1.546
Assertiveness	3.952	.738	.110	-1.193
Withdrawal from Others	3.429	.756	.747	-.309
Carefreeness	2.595	.456	-.392	-.193
Honesty	3.893	.738	-.240	-.401
Thriftiness	3.321	.421	.829	-1.017
Getting Ahead	3.321	.608	.511	-.666
Teacher Efficacy Beliefs Scale (TEBS)	3.181	.361	.082	-.221

Time 2	Mean	Std. Deviation	Skewness	Kurtosis
GSVI Overall	3.603	.286	-.027	2.103
International Harmony & Equality	4.064	.821	-1.378	2.689
National Strength & Order	3.268	.852	.487	-.114
Traditional Religiosity	2.714	1.263	.620	-.810
Personal Growth & Inner Harmony	4.202	.490	.370	-.649
Physical Well-being	4.095	.561	-.074	.183
Secure & Satisfying Interpersonal Relationships	4.057	.573	-.129	-.605
Social Standing	3.095	.733	-.778	1.595
Social Stimulation	3.500	.734	.511	-.253
Individual Rights	3.429	.587	-.015	-1.281
MVI Overall	3.488	.321	.963	.819
Positive Orientation to Others	4.129	.629	-1.028	2.729
Competence & Effectiveness	4.077	.463	-.827	-.220
Proprietary in Dress & Manners	3.571	.636	.006	-.901
Religious Commitment	3.161	1.150	-.047	-.452
Assertiveness	3.571	.646	-.490	-.787
Withdrawal from Others	3.286	.825	.332	-1.023
Carefreeness	2.619	.469	-.675	-.123
Honesty	3.893	.712	-.122	-.139
Thriftiness	3.286	.508	.031	-.933
Getting Ahead	3.250	.672	.443	-1.037
Teacher Efficacy Beliefs Scale (TEBS)	3.136	.321	.582	.295

Table 3. Students' mean, standard deviation, skewness, and kurtosis for questionnaire measures' subscales.

Time 1	Mean	Std. Deviation	Skewness	Kurtosis
GSVI Overall	3.891	.392	-.302	-.086
International Harmony & Equality	4.148	.507	-.654	.880
National Strength & Order	3.699	.830	-.500	.002
Traditional Religiosity	3.088	1.166	.009	-1.140
Personal Growth & Inner Harmony	4.534	.456	-1.113	1.386
Physical Well-being	4.174	.738	-.831	.786
Secure & Satisfying Interpersonal Relationships	4.308	.571	-1.112	2.373
Social Standing	3.123	.805	-.185	-.114
Social Stimulation	3.814	.795	-.575	.451
Individual Rights	4.120	.551	-.483	.201
MVI Overall	3.809	.346	-.263	.621
Positive Orientation to Others	4.262	.548	.215	6.820
Competence & Effectiveness	4.380	.432	-.891	2.235
Proprietary in Dress & Manners	3.797	.676	-.498	.231
Religious Commitment	3.405	.971	-.331	-.577
Assertiveness	4.088	.741	-.624	.187
Withdrawal from Others	4.062	.822	-.623	-.294
Carefreeness	3.109	.766	.007	.214
Honesty	3.951	.815	-.634	.292
Thriftiness	3.060	.630	-.050	.521
Getting Ahead	3.953	.825	-.404	-.638
Teacher Efficacy Beliefs Scale (TEBS)	3.328	.525	-.625	.004

Time 2	Mean	Std. Deviation	Skewness	Kurtosis
GSVI Overall	3.898	.422	-.508	.452
International Harmony & Equality	4.166	.552	-.734	.733
National Strength & Order	3.653	.868	-.619	.216
Traditional Religiosity	3.052	1.181	-.031	-1.164
Personal Growth & Inner Harmony	4.535	.472	-1.051	.851
Physical Well-being	4.170	.763	-.940	1.138
Secure & Satisfying Interpersonal Relationships	4.290	.606	-1.290	2.360
Social Standing	3.209	.828	-.319	-.061
Social Stimulation	3.874	.795	-.413	-.173
Individual Rights	4.127	.566	-.453	-.269
MVI Overall	3.801	.400	-.970	3.164
Positive Orientation to Others	4.257	.532	-.976	1.846
Competence & Effectiveness	4.409	.464	.264	6.377
Proprietary in Dress & Manners	3.794	.694	-.516	.036
Religious Commitment	3.457	.965	-.418	-.335
Assertiveness	4.106	.750	-.527	-.408
Withdrawal from Others	4.124	.804	-.794	.369
Carefreeness	3.084	.746	-.151	.165
Honesty	4.030	.769	-.582	-.187
Thriftiness	3.028	.602	-.237	.390
Getting Ahead	3.950	.842	-.614	-.060
Teacher Efficacy Beliefs Scale (TEBS)	3.341	.562	-.930	1.195

There were nine subscales for the GSVI and ten subscales for the MVI which results in a number of tests for each hypothesis. The process of False Discovery Rate (FDR) control was used to control inflation of alpha (Maxwell & Delaney, 2004). For each set of analyses (e.g., for the GSVI overall and its nine subscales) exact p values were recorded and then each set of p values was rank ordered. Each p value was compared in turn with the adjusted p value ranging from .05 down to .05/number of tests conducted. Follow-up tests were conducted when results were significant by the FDR criterion.

The main hypotheses were then tested. As a reminder, they are:

- 1) Students will demonstrate BVA change over time while professors' BVAs will remain relatively stable over time.
- 2) Students' attributes will influence BVA change. It is expected that students who are younger (under 21); have less college experience (freshman/sophomore; undergraduates); report a weak adherence to values at the start of the semester; or have little to no religious commitment will report higher levels of BVA change compared to their counterparts.
- 3) Students, especially those who have a positive experience in the class, may assimilate to professors' BVAs. Students will be more aligned to professors' values at the end of the semester compared to the first week of the semester.

Analyses

Hypothesis 1: Overall, students will demonstrate BVA change over time while professors' BVAs will remain relatively stable over time. BVA scores reported on the first questionnaire were compared with the BVA scores reported on the second

questionnaire. The comparison was made using the subscales from the GSVI and MVI. Each measure's subscales and its average calculated score are listed in Tables 2 and 3. Analyses tested if there was a significant change in the mean for each subscale from Time 1 to Time 2 among professors and students.

One-way *t* tests were conducted to test if the professors' and students' BVAs changed over time. If change from Time 1 to Time 2 did exist, the direction of change was expected to vary across participants; therefore, absolute difference in average score for each GSVI and MVI subscale from Time 1 to Time 2 was calculated and used as the dependent variable. Professor and student data were analyzed separately.

Professors. The hypothesis that professors' values would be stable over time was not supported. Unexpectedly, the GSVI, MVI, and all their subscales showed significant change from the start of the semester to the end of the semester. This demonstrates that professors' values are not stable but, contrary to expectations, are changing over time. Results are summarized in Table 4.

Table 4. Tests of change for professors' GSVI and MVI values for Time 1 to Time 2.

GSVI					
Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
GSVI Overall	.233	.141	.325	5.473	<.001*
International Harmony & Equality	.250	.117	.384	4.046	.001*
National Strength & Order	.321	.122	.521	3.479	.004*
Traditional Religiosity	.411	.173	.648	3.735	.002*
Personal Growth & Inner Harmony	.357	.185	.530	4.476	.001*
Physical Well-being	.167	.021	.313	2.463	.029*
Secure & Satisfying Interpersonal Relationships	.314	.147	.482	4.048	.001*
Social Standing	.500	.042	.958	2.360	.035*
Social Stimulation	.464	.135	.794	3.045	.009*
Individual Rights	.631	.291	.971	4.008	.001*

critical *p* values range = [.05, .005] *significant by FDR criterion

MVI					
Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
MVI Overall	.186	.077	.294	3.691	.003*
Positive Orientation to Others	.255	.122	.389	4.146	.001*
Competence & Effectiveness	.258	.125	.392	4.183	.001*
Proprietary in Dress & Manners	.276	.153	.399	4.837	<.001*
Religious Commitment	.482	.252	.712	4.534	.001*
Assertiveness	.429	.197	.660	3.994	.002*
Withdrawal from Others	.571	.275	.868	4.163	.001*
Carefreeness	.262	.108	.416	3.667	.003*
Honesty	.714	.361	1.067	4.372	.001*
Thriftiness	.321	.139	.504	3.798	.002*
Getting Ahead	.286	.099	.472	3.309	.006*

critical *p* values range = [.05, .0045] *significant by FDR criterion

Students. *t* tests were again used to examine change in values for all students from Time 1 to Time 2. The hypothesis that students' values would change over time was supported. As shown in Table 5, students' values for the GSVI overall, the MVI overall, and all the subscales were found to significantly change over time, $p < .001$.

Table 5. Tests of change for students' GSVI and MVI values for Time 1 to Time 2.

GSVI					
Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
GSVI Overall	.210	.193	.227	24.163	<.001*
International Harmony & Equality	.340	.312	.367	24.371	<.001*
National Strength & Order	.495	.450	.541	21.314	<.001*
Traditional Religiosity	.414	.375	.454	20.587	<.001*
Personal Growth & Inner Harmony	.278	.250	.306	19.562	<.001*
Physical Well-being	.395	.352	.438	18.007	<.001*
Secure & Satisfying Interpersonal Relationships	.362	.331	.394	22.290	<.001*
Social Standing	.505	.463	.548	23.548	<.001*
Social Stimulation	.484	.436	.532	19.763	<.001*
Individual Rights	.395	.362	.427	24.160	<.001*

critical *p* values range = [.05, .005] *significant by FDR criterion

MVI					
Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
MVI Overall	.246	.222	.271	19.738	<.001*
Positive Orientation to Others	.299	.269	.329	19.612	<.001*
Competence & Effectiveness	.299	.270	.329	20.228	<.001*
Proprietary in Dress & Manners	.366	.335	.397	23.174	<.001*
Religious Commitment	.532	.483	.581	21.259	<.001*
Assertiveness	.488	.444	.533	21.668	<.001*
Withdrawal from Others	.565	.509	.621	19.750	<.001*
Carefreeness	.492	.448	.536	21.770	<.001*
Honesty	.574	.517	.630	19.995	<.001*
Thriftiness	.421	.377	.466	18.590	<.001*
Getting Ahead	.510	.459	.562	19.499	<.001*

critical *p* values range = [.05, .0045] *significant by FDR criterion

It was hypothesized that professors' values would remain stable over time while students' values changed from the start to the end of the semester. These findings show that both professors' and students' values are changing. However, students showed greater change for their values as measured by the MVI. The mean difference between professors and students was similar for the GSVI. Professors' mean difference for the GSVI overall was .233 and students' was .210. For the MVI overall, professors' mean difference was .186 but students' was .247. The averages of the mean differences for the GSVI and MVI subscales were also calculated. The average of the mean differences for the GSVI subscales was .365 for professors and .388 for students. The average of the mean differences for the MVI subscales was .375 for professors, and .455 for students. As summarized in Table 6, students more frequently had higher mean differences, meaning their values are changing to a greater extent on more subscales than professors. Out of the 21 values examined, students were found to be changing more than professors for 16 of them. A sign test was used and found that the frequency of students changing more than professors was significantly greater than chance [relative frequency of greater change for students = 76%, relative frequency of greater change for professors = 24%, $p = .027$].

Table 6. Comparison of GSVI and MVI mean absolute differences for professors and students.

Values	Student Mean Absolute Difference	Professor Mean Absolute Difference	Students changing more	Professors changing more
GSVI Overall	.210	.233		x
International Harmony & Equality	.340	.250	x	
National Strength & Order	.495	.321	x	
Traditional Religiosity	.414	.411	x	
Personal Growth & Inner Harmony	.278	.357		x
Physical Well-being	.395	.167	x	
Secure & Satisfying Interpersonal Relationships	.362	.314	x	
Social Standing	.505	.500	x	
Social Stimulation	.484	.464	x	
Individual Rights	.394	.631		x
MVI Overall	.247	.186	x	
Positive Orientation to Others	.299	.255	x	
Competence & Effectiveness	.299	.258	x	
Proprietary in Dress & Manners	.366	.276	x	
Religious Commitment	.532	.482	x	
Assertiveness	.488	.429	x	
Withdrawal from Others	.565	.571		x
Carefreeness	.492	.262	x	
Honesty	.574	.714		x
Thriftiness	.421	.321	x	
Getting Ahead	.510	.286	x	

In order to estimate the test-retest reliabilities for each measure, correlations were calculated between Time 1 and Time 2 data for the GSVI, the MVI, and their subscales. Test-retest reliabilities were compared to those found for the measures in Braithwaite and Law (1985). Where comparisons could be made, professors' test-retest correlations were all higher when compared to Braithwaite and Law's test-retest correlations, except for the Social Standing subscale. Social Standing, Social Stimulation, Individual Rights, Carefreeness, Honesty, and Thriftiness had test-retest correlations less than .50. The average for the test-retest reliabilities for subscales which did have comparable scores in Braithwaite and Law was .73 for professors. This was dramatically higher than the average for subscales which did not have comparable test-retest reliabilities ($M = .27$), suggesting that the subscales without reported test-retest reliabilities are newer, less solid subscales. For students, only the GSVI and MVI overall test-retests correlations were higher than those reported in Braithwaite and Law. Differences between the average for test-retest reliabilities with published comparisons in Braithwaite and Law and the average for those without published comparisons were not as dramatic, $M = .68$, $M = .51$, respectively. Mean signed differences (Time 2 minus Time 1) were also calculated to examine the change across time for the GSVI and MVI total scores and their subscales. Nonparametric sign tests found that professors were declining on 19 of the 21 GSVI and MVI subscales as indicated by signed differences, which was significantly greater than change [Decline over time: 90%, Increase over time: 10%, $p < .001$]. Signed differences were especially low for students, suggesting that their increases and decreases across classes might be cancelling each other out in the computation of the overall means. In addition, there was not a trend towards positive or negative increase over time. A sign

test found that students were declining on 9 of 21 (43%) GSVI and MVI subscales as indicated by signed differences; this was not significantly different from chance ($p = .664$). Calculations are reported in Table 7. These findings directed the analyses to investigate heterogeneity between classes in directional change over time in addition to the previously reported analyses of absolute change over time.

Table 7. Test-retest correlations and mean signed differences for GSVI, MVI, and their subscales.

Measure	Professor		
	Mean Signed Difference T2-T1	Test-retest correlation for Professor data	Test-retest correlation Braithwaite & Law (1985)
GSVI Overall	-.136	.627	.62*
International Harmony & Equality	-.107	.921	.73
National Strength & Order	-.143	.857	.81
Traditional Religiosity	-.232	.904	.93
Personal Growth & Inner Harmony	-.214	.617	.70
Physical Well-being	.024	.851	.71
Secure Interpersonal Relationships	-.029	.753	.71
Social Standing	-.119	-.032	.77
Social Stimulation	-.036	.473	.58
Individual Rights	-.3690	.129	N/A
MVI Overall	-.100	.749	.61*
Positive Orientation to Others	-.025	.831	.80
Competence & Effectiveness	-.060	.820	.81
Proprietary in Dress & Manners	-.071	.844	.84
Religious Commitment	-.268	.872	.81
Assertiveness	-.381	.796	.68
Withdrawal from Others	-.143	.528	N/A
Carefreeness	.024	.298	N/A
Honesty	.000	.123	N/A
Thriftiness	-.036	.276	N/A
Getting Ahead	-.071	.776	.72

$n = 14$, *from Hall et al., 2011

Table 7 (cont). Test-retest correlations and mean signed differences for GSVI and MVI subscales.

Measure	Student		
	Mean Signed Difference T2-T1	Test-retest correlation for Student data	Test-retest correlation Braithwaite & Law (1985)
GSVI Overall	.008	.776	.62*
International Harmony & Equality	.022	.661	.73
National Strength & Order	-.050	.680	.81
Traditional Religiosity	-.033	.880	.93
Personal Growth & Inner Harmony	.007	.634	.70
Physical Well-being	-.002	.695	.71
Secure Interpersonal Relationships	-.020	.658	.71
Social Standing	.087	.671	.77
Social Stimulation	.066	.630	.58
Individual Rights	.013	.578	N/A
MVI Overall	-.009	.732	.61*
Positive Orientation to Others	.005	.689	.80
Competence & Effectiveness	.030	.565	.81
Proprietary in Dress & Manners	-.003	.749	.84
Religious Commitment	.056	.717	.81
Assertiveness	.012	.605	.68
Withdrawal from Others	.080	.521	N/A
Carefreeness	-.025	.412	N/A
Honesty	.085	.491	N/A
Thriftiness	-.034	.527	N/A
Getting Ahead	-.006	.619	.72

n = 399, *from Hall et al., 2011

It was expected that classes would be heterogeneous, for example, with some classes attracting students with different patterns of values than other classes. To better understand the heterogeneity between classes quantitatively, the intraclass correlation coefficient was calculated to assess what proportion of the variance was accounted for by the random effect of class (Maxwell & Delaney, 2004). Because students were nested within classes, this was done to determine if differences between classes influenced varying levels of GSVI scores and MVI scores, and therefore, if nesting should be accounted for in the analysis by treating classes as a nested random factor. The intraclass

correlation coefficients (ICCs) were calculated. For the GSVI overall score, 13.86% of the observed variance was due to differences between classes. For the MVI overall score, 10.74% of the observed variance was due to differences between classes. The ICCs indicated heterogeneity between classes so nested model analyses were used to test the study hypotheses. Course code was used as a random nested factor to account for differences between classes.

To examine BVA change in students from the start to the end of the semester, the SPSS MANOVA routine was used. MANOVA was used in order to look at change over time while still accounting for the heterogeneity between classes. The use of MANOVA allowed for the unique variance across classes to be pooled and used as a single error term. Since classes were also of varying sizes, the smallest having four student participants and the largest having 91, the use of Type III sums of squares helped prevent effects in larger classes from overshadowing potential effects present in smaller classes. It was also expected that courses which focused on value-based topics would increase in their values over time but non-values based classes were expected to show no change over time or even possible decreases.

MANOVA was used to test the interaction between time and courses for the GSVI overall, MVI overall, and the subscales. Because now the concern is not just with magnitude of change but with direction of change, signed difference scores (subtracting scores at Time 1 from those at Time 2) were used as the dependent variable instead of absolute value of differences. Results from these analyses are shown in Table 8. The interaction between time and courses for the GSVI overall and its subscales were not

significant indicating that change over time for this measure was not a function of courses.

Table 8. The interaction of course with students' GSVI and MVI value change from Time 1 to Time 2 (dependent variable includes direction of change).

GSVI		
Measure	<i>F</i> (17, 373)	<i>p</i> value
GSVI Overall	.85	.635
International Harmony & Equality	.96	.505
National Strength & Order	1.34	.166
Traditional Religiosity	1.47	.101
Personal Growth & Inner Harmony	.63	.868
Physical Well-being	.61	.885
Secure & Satisfying Interpersonal Relationships	.56	.920
Social Stimulation	.65	.850
Social Standing	.79	.702
Individual Rights	1.07	.383

critical *p* values range = [.05, .005] *significant by FDR criterion

MVI		
Measure	<i>F</i> (17, 384)	<i>p</i> value
MVI Overall	2.44	.001*
Positive Orientation to Others	1.83	.023
Competence & Effectiveness	1.42	.122
Proprietary in Dress & Manners	.93	.543
Religious Commitment	.91	.568
Assertiveness	2.44	.001*
Withdrawal from Others	.88	.596
Carefreeness	.73	.770
Honesty	.83	.661
Thriftiness	.91	.567
Getting ahead	1.22	.242

critical *p* values range = [.05, .0045] *significant by FDR criterion

For the MVI and its subscales, courses were found to impact value change over time. Students' MVI overall score was found to significantly differ across the 19 classes, $F(17, 384) = 2.44, p = .001$ (see Figure 2).

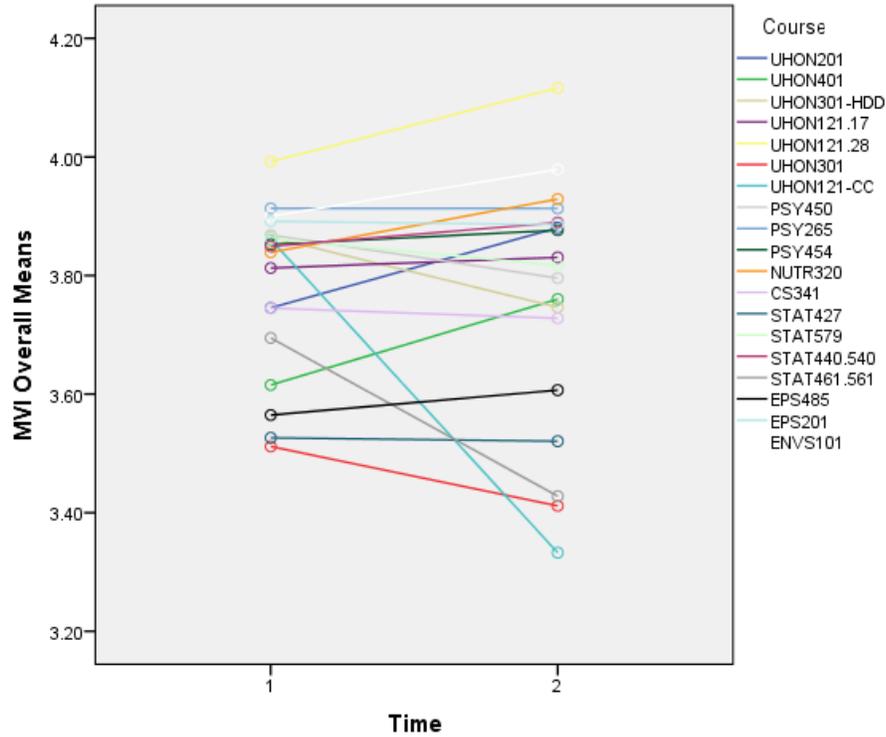


Figure 2. Students' MVI overall found to significantly differ across classes over time.

Follow up analyses found that values-based classes courses differed in the amount of change over time, $F(10, 384) = 3.53, p < .001$, while no significant difference in amount of change was detected with non-values based classes (see Figure 3).

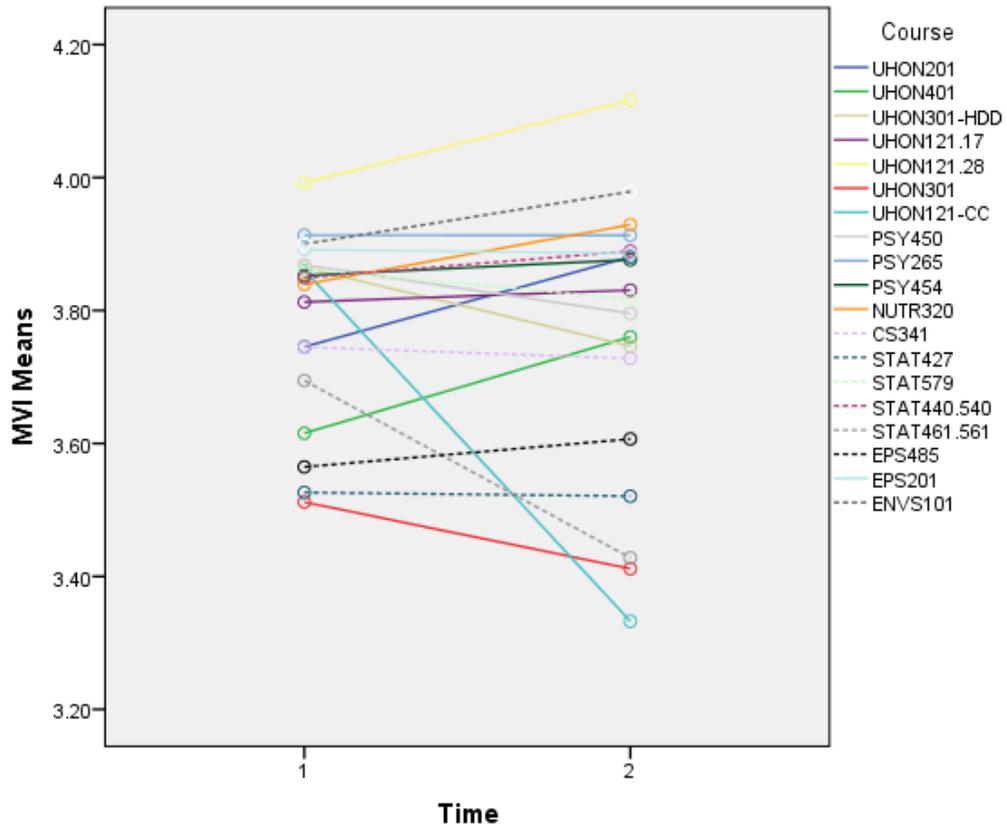


Figure 3. Students' MVI overall for values-based classes courses found to significantly differ in the amount of change over time, but not for non-values based classes.

It was found that Honors courses showed significant differences across courses in amount of change, $F(6, 384) = 4.84, p < .001$. Two courses taught by the same instructor, UHON121CC and UHON301, specifically showed significantly different change in MVI overall. Calculating change by subtracting the Time 1 mean from the Time 2 mean so that positive differences indicated a greater endorsement of that value, and negative differences indicated a decrease, the freshman class UHON121CC taught by this instructor showed a greater decrease in MVI overall ($\bar{D}_M = -.528$) than the higher level course UHON301 ($\bar{D}_M = -.100$), $F(1, 384) = 8.11, p = .005$. Similarly, these two courses

had a greater decline in MVI overall than observed in a senior level Honors seminar, UHON 401, ($\bar{D}_M = +.145$), $F(1, 384) = 8.11$, $p = .005$. Finally, two subgroups of Honors faculty were formed based on whether the professor was above or below the mean on Traditional Religiosity. The modest increase in MVI overall ($\bar{D}_M = +.040$) for the four seminars (UHON201, UHON310-HDD, UHON121.17, UHON121.18) taught by the Honors faculty who were above the mean in Traditional Religiosity was significantly different than the overall mean decrease in MVI overall ($\bar{D}_M = -.161$) seen in the three seminars (UHON401, UHON301, UHON121-CC) taught by faculty who were below the mean in Traditional Religiosity, $F(1, 384) = 5.34$, $p = .021$. Table 9 summarizes the change over time for MVI overall for each course.

Table 9. Change in MVI overall from Time 1 to Time 2 for individual courses.

Course	Mean Difference ($\bar{D}_M = T2 - T1$)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
UHON201	.136	1	3.745	.104	3.541	3.950
		2	3.881	.118	3.648	4.113
UHON401	.145	1	3.615	.109	3.400	3.831
		2	3.760	.125	3.515	4.005
UHON301-HDD	-.118	1	3.864	.082	3.703	4.026
		2	3.746	.093	3.563	3.930
UHON121.17	.018	1	3.813	.116	3.584	4.041
		2	3.831	.132	3.571	4.090
UHON121.28	.125	1	3.992	.147	3.703	4.281
		2	4.117	.167	3.788	4.445
UHON301	-.100	1	3.512	.104	3.308	3.716
		2	3.412	.118	3.179	3.644
UHON121-CC	-.528	1	3.861	.099	3.666	4.055
		2	3.333	.113	3.111	3.554
PSY450	-.072	1	3.868	.091	3.689	4.047
		2	3.796	.104	3.592	3.999
PSY265	.00	1	3.913	.042	3.830	3.997
		2	3.913	.048	3.818	4.008
PSY454	.024	1	3.852	.034	3.785	3.920
		2	3.876	.039	3.799	3.953
NUTR320	.090	1	3.839	.063	3.715	3.963
		2	3.929	.072	3.788	4.070
CS341	-.017	1	3.745	.075	3.597	3.893
		2	3.728	.086	3.559	3.896
STAT427	-.005	1	3.526	.055	3.417	3.635
		2	3.521	.063	3.397	3.645
STAT579	-.045	1	3.862	.147	3.573	4.151
		2	3.817	.167	3.489	4.146
STAT440.540	.040	1	3.849	.099	3.655	4.044
		2	3.889	.113	3.668	4.111
STAT461.561	-.267	1	3.695	.116	3.466	3.923
		2	3.428	.132	3.168	3.688
EPS485	.042	1	3.565	.095	3.378	3.751
		2	3.607	.108	3.395	3.819
EPS201	-.005	1	3.891	.056	3.781	4.002
		2	3.886	.064	3.760	4.012
ENVS101	.079	1	3.900	.075	3.752	4.048
		2	3.979	.086	3.810	4.147

Changes in students' levels of Assertiveness over time were also found to significantly differ across classes, $F(17, 369) = 2.44, p = .001$ (see Figure 4).

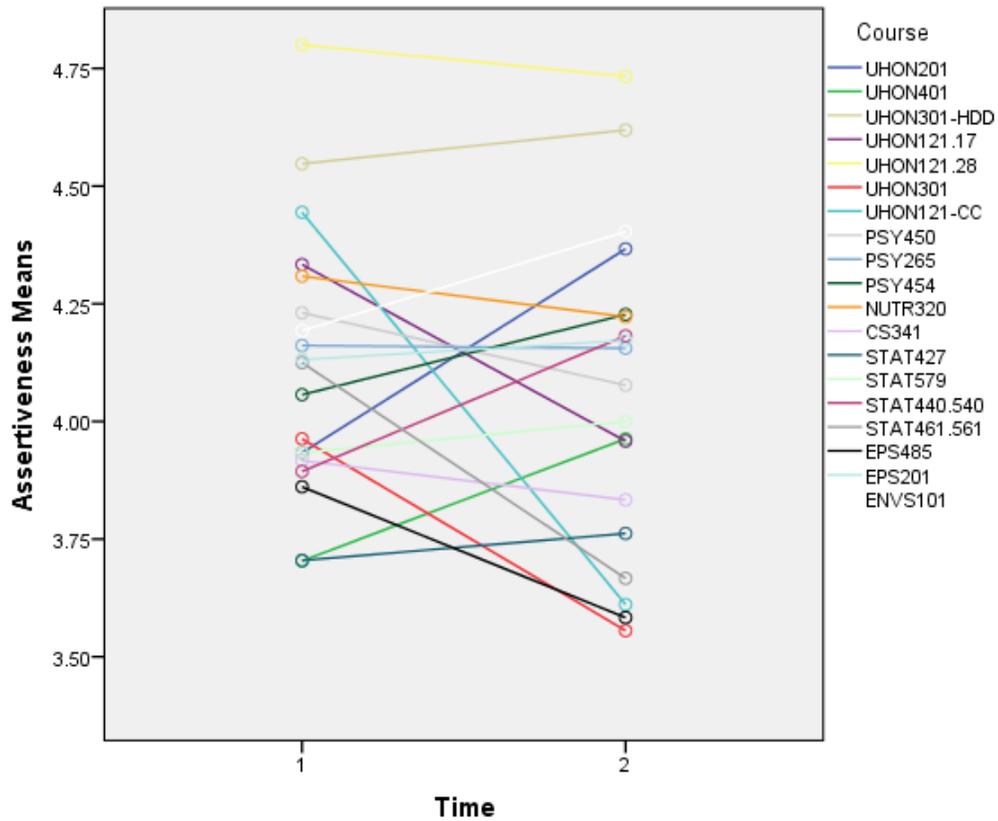


Figure 4. Students' Assertiveness found to significantly differ across classes in amount of change over time.

Follow up analyses mirrored those of the change in MVI overall. While non-values based classes did not differ significantly in amount of change, values-based classes did differ significantly in changes in Assertiveness over time, $F(10, 369) = 3.01, p = .001$ (see Figure 5).

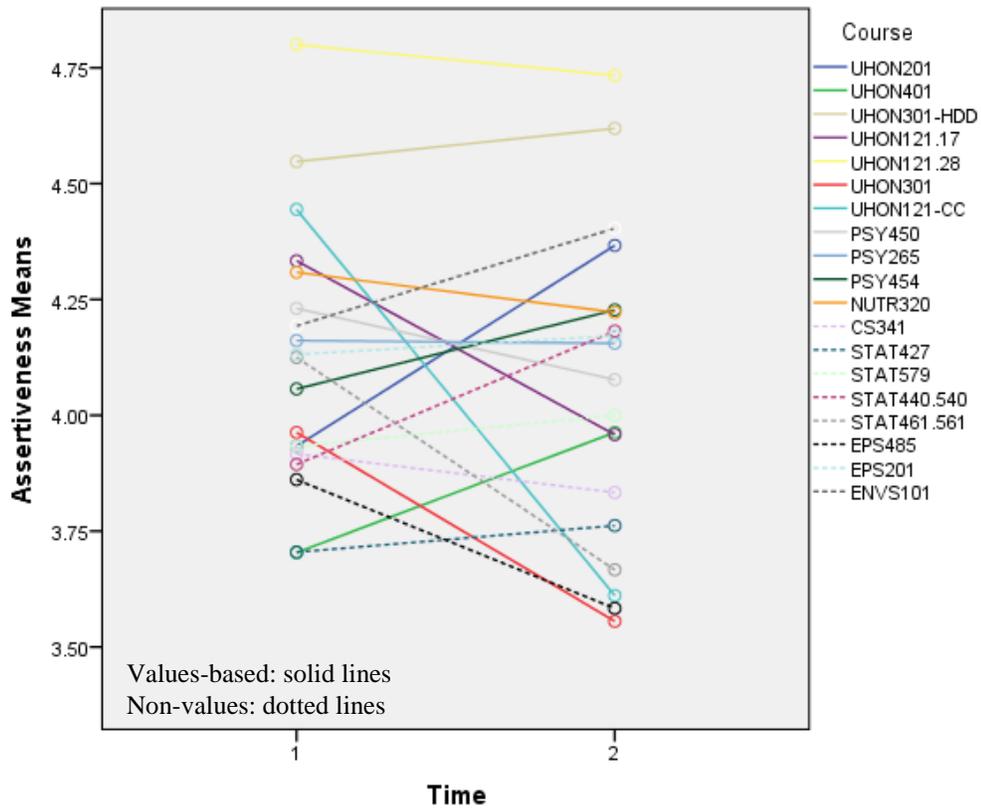


Figure 5. Students' Assertiveness for values-based classes found to significantly differ in the amount of change over time, but not for non-values based classes.

Further analyses again found that the source of significant differences in change was with the Honors classes, $F(6, 369) = 3.70, p = .001$. Three single degree of freedom contrasts isolated the locus of the effect. First, Assertiveness declined in two classes taught by one instructor, UHON301 ($\bar{D}_M = -.407$) and particularly in the freshman class UHON121-CC ($\bar{D}_M = -.833$), more, $F(1, 369) = 10.52, p < .001$, than in a 400-level seminar taught by a different instructor, UHON401 ($\bar{D}_M = .259$) where Assertiveness increased somewhat. Similarly, Assertiveness in two other freshman level Honors classes taught by another instructor, UHON121.17 ($\bar{D}_M = -.375$) and UHON121.28 ($\bar{D}_M = -.067$), declined which was significantly different than the increase in Assertiveness seen in two higher level seminars, UHON201 ($\bar{D}_M = .433$) and UHON301-HDD ($\bar{D}_M = .071$), $F(1, 369) = 4.43, p = .036$. Finally, the modest overall mean increase in student Assertiveness ($\bar{D}_M = .016$) seen in the four seminars (UHON201, UHON310-HDD, UHON121.17, UHON121.18) taught by the Honors faculty who were above the mean in Traditional Religiosity was significantly different than the overall mean decrease in student Assertiveness ($\bar{D}_M = -.327$) seen in the three seminars (UHON401, UHON301, UHON121-CC) taught by faculty who were below the mean in Traditional Religiosity. Table 10 summarizes the change over time for Assertiveness for each course.

Table 10. Change in Assertiveness from Time 1 to Time 2 for individual courses.

Course	Mean Difference* (\bar{D}_M)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
UHON201	.433	1	3.933	.230	3.481	4.386
		2	4.367	.231	3.913	4.820
UHON401	.259	1	3.704	.243	3.227	4.181
		2	3.963	.243	3.485	4.441
UHON301-HDD	.071	1	4.548	.194	4.165	4.930
		2	4.619	.195	4.236	5.002
UHON121.17	-.375	1	4.333	.257	3.828	4.839
		2	3.958	.258	3.451	4.465
UHON121.28	-.067	1	4.800	.325	4.160	5.440
		2	4.733	.326	4.092	5.375
UHON301	-.407	1	3.963	.243	3.486	4.440
		2	3.556	.243	3.078	4.034
UHON121-CC	-.833	1	4.444	.297	3.860	5.029
		2	3.611	.298	3.026	4.196
PSY450	-.154	1	4.231	.202	3.834	4.628
		2	4.077	.202	3.679	4.475
PSY265	-.005	1	4.161	.094	3.976	4.346
		2	4.156	.094	3.970	4.341
PSY454	.170	1	4.057	.078	3.904	4.209
		2	4.227	.078	4.074	4.380
NUTR320	-.087	1	4.309	.140	4.033	4.584
		2	4.222	.140	3.946	4.498
CS341	-.084	1	3.917	.182	3.559	4.274
		2	3.833	.182	3.475	4.192
STAT427	.057	1	3.705	.123	3.463	3.947
		2	3.762	.123	3.520	4.004
STAT579	.067	1	3.933	.325	3.294	4.573
		2	4.00	.326	3.359	4.641
STAT440.540	.288	1	3.894	.219	3.463	4.325
		2	4.182	.220	3.749	4.614
STAT461.561	-.458	1	4.125	.257	3.619	4.631
		2	3.667	.258	3.160	4.174
EPS485	-.278	1	3.861	.210	3.448	4.274
		2	3.583	.211	3.169	3.997
EPS201	.041	1	4.131	.127	3.882	4.380
		2	4.172	.127	3.922	4.421
ENVS101	.211	1	4.193	.167	3.865	4.521
		2	4.404	.167	4.075	4.732

*Mean difference = Time 2 minus Time 1

These findings suggest that the change in students' specific values, as shown with the analyses for MVI overall and Assertiveness, was specific to individual classroom environments. This could be because of the course material or level of the course, because of the professors' emphasis on specific values, or both. The impact of professors' values on students is explored further in Hypothesis 3, which directly tests value assimilation between professors and students.

Effect sizes for directional changes. Because of the widely varying sample sizes of the two groups, it was expected that there would be considerably less power to detect change in the professors than to detect change in the students; thus, estimates of effect size are reported with the expectation that the student's effect size would be larger than that of the professors. This was both supported and opposed by the findings. Students' absolute value of the effect sizes for directional change (Cohen's *d*) ranged from .003 to .109 with a mean of .043 and professors' ranged from .00 to .549, with a mean of .199. Unexpectedly, professors consistently had higher effect sizes than students. Part of the explanation for this may be that students were nested into heterogeneous classes, some of which increased and some of which decreased on a particular scale, with the changes tending to balance out over classes. Table 11 reports effect sizes for professors' and students', respectively. Signed values are reported to demonstrate the direction of change from Time 2 to Time 1: positive effect sizes indicate increase in that value over time, whereas negative scores indicate a decrease. Using a sign test it was found that professors reported higher effect sizes more frequently than students, and this was significantly greater than chance [relative frequency of higher effect sizes for professors = 90%, relative frequency of higher effect sizes for students = 10%, $p < .001$].

Table 11. Comparison of professor and student effect sizes when testing for GSVI and MVI value change over time.

Values	Professors' Cohen's d^+	Students' Cohen's d^+	Students have higher effect size	Professors have higher effect size
GSVI Overall	-.466	.020		x
International Harmony & Equality	-.129	.042		x
National Strength & Order	-.167	-.059		x
Traditional Religiosity	-.196	-.028		x
Personal Growth & Inner Harmony	-.446	.015		x
Physical Well-being	.043	-.003		x
Secure & Satisfying Interpersonal Relationships	-.047	-.034		x
Social Standing	-.182	.107		x
Social Stimulation	-.049	.083	x	
Individual Rights	-.614	.023		x
MVI Overall	-.349	-.021		x
Positive Orientation to Others	-.043	.009		x
Competence & Effectiveness	-.112	.067		x
Proprietary in Dress & Manners	-.115	-.004		x
Religious Commitment	-.261	.058		x
Assertiveness	-.549	.017		x
Withdrawal from Others	-.181	.098		x
Carefreeness	.051	-.033		x
Honesty	.000	.109	x	
Thriftiness	-.077	-.071		x
Getting Ahead	-.111	-.007		x

Values in Action (VIA) analyses. Participants also completed the VIA assessment in their questionnaire packet. The VIA contains 72 items and measures the following 24 values:

- wisdom – creativity, curiosity, judgment, love of learning, perspective
- courage – bravery, perseverance, honesty, zest
- humanity – love, kindness, social intelligence
- justice – teamwork, fairness, leadership
- temperance – forgiveness, humility, prudence, self-regulation

- transcendence – appreciation of beauty and excellence, gratitude, hope, humor, spirituality

The VIA was scored through the VIA Institute on Character. Every item of the VIA questionnaire required a response in order to score the data. If a participant left even one item in the VIA unanswered, the entire measure could not be analyzed. This reduced the sample size from 14 to 11 professors and from 414 to 233 students. Two classes were removed entirely from the dataset dropping the number of classes from 20 to 18.

Assumptions of normality of distributions, homogeneity of variance, and multicollinearity were again checked for in the final VIA dataset. As shown in Table 12, four of the professors' subscales suggested skewness levels slightly above 1.0, indicating modest deviation from normality of distribution: Teamwork (1.073 at Time 2), Honesty (-1.196 at Time 1), Hope (-1.023 at Time 1), and Perseverance (-1.047 at Time 1). From Table 13, two of the students' subscales had skewness levels above 1.0: Prudence (-1.075 at Time 1) and Love (-1.143 at Time 2). Homogeneity of variance was assumed considering that all the scales had reasonable standard deviations. Multicollinearity was also checked for and was not found to be a concern. Absolute values correlations between subscales were less than .50. The process of False Discovery Rate (FDR) control was again used to control for alpha and follow-up tests were conducted where results were significant by the FDR criterion.

Table 12. Professors' mean, standard deviation, skewness, kurtosis for VIA subscales.

Time 1				
	Mean	Std. Deviation	Skewness	Kurtosis
Appreciation of Beauty	3.424	.790	.540	-.103
Bravery	3.545	.820	.513	-.402
Love	4.242	.651	-.812	-.195
Prudence	3.485	.503	-.322	-1.584
Teamwork	3.424	.761	-.532	.292
Creativity	3.879	.946	-.672	-.190
Curiosity	3.818	.603	.523	-1.156
Fairness	3.909	.908	-.412	-1.356
Forgiveness	3.576	.651	.073	-.812
Gratitude	3.545	.847	-.351	.402
Honesty	4.455	.501	-1.196	1.247
Hope	3.697	.605	-1.023	1.344
Humor	4.136	.951	-.476	-1.449
Perseverance	3.879	.885	-1.047	.911
Judgment	4.182	.603	-.028	-1.231
Kindness	3.939	.828	-.610	-.372
Leadership	3.636	.767	-.046	.003
Love of Learning	4.152	.565	.321	-1.064
Humility	2.909	.474	-.438	.187
Perspective	3.485	.565	-.583	.390
Self-Regulation	3.000	.558	.157	.136
Social Intelligence	3.606	.728	-.775	.314
Spirituality	2.606	1.672	.660	-1.668
Zest	3.576	.616	-.093	-.363

Time 2				
	Mean	Std. Deviation	Skewness	Kurtosis
Appreciation of Beauty	3.212	1.057	-.099	-.974
Bravery	3.667	.816	.200	-.806
Love	4.212	.543	.042	-.813
Prudence	3.485	.431	-.387	-.351
Teamwork	3.455	.688	1.073	1.363
Creativity	3.727	.880	.000	-.869
Curiosity	4.030	.586	.642	-.577
Fairness	3.879	.834	-.197	-.954
Forgiveness	3.758	.496	.319	-.455
Gratitude	3.758	.701	.035	-.576
Honesty	4.364	.379	-.211	-.065
Hope	3.758	.616	-.951	2.256
Humor	4.000	.894	-.769	-.586
Perseverance	3.939	.534	.180	.891
Judgment	4.242	.449	-.294	.735
Kindness	3.939	.772	-.203	-1.233
Leadership	3.848	.721	.215	-.045
Love of Learning	3.818	.751	.586	-1.188
Humility	3.061	.647	.492	.300
Perspective	3.697	.623	.515	1.238
Self-Regulation	3.091	.920	-.311	-.700
Social Intelligence	3.424	.716	.086	-.808
Spirituality	2.606	1.750	.627	-1.692
Zest	3.576	.701	.755	.039

Table 13. Students' mean, standard deviation, skewness, kurtosis for VIA subscales.

Time 1				
	Mean	Std. Deviation	Skewness	Kurtosis
Appreciation of Beauty	3.825	.876	-.773	.591
Bravery	3.710	.870	-.338	-.615
Love	4.115	.853	-1.075	.866
Prudence	3.614	.892	-.398	-.317
Teamwork	3.780	.805	-.708	.338
Creativity	3.620	.739	-.176	-.316
Curiosity	3.824	.638	-.256	-.316
Fairness	4.185	.632	-.679	.541
Forgiveness	3.523	.842	-.416	-.210
Gratitude	4.052	.716	-.905	1.276
Honesty	4.238	.567	-.548	.342
Hope	3.921	.730	-.561	-.072
Humor	4.132	.784	-.814	.349
Perseverance	3.851	.794	-.285	-.550
Judgment	4.097	.714	-.651	.080
Kindness	4.021	.711	-.536	-.087
Leadership	3.906	.722	-.380	-.240
Love of Learning	3.716	.926	-.394	-.724
Humility	3.395	.766	-.074	-.076
Perspective	3.954	.745	-.467	-.133
Self-Regulation	2.994	.827	.087	-.371
Social Intelligence	3.544	.790	-.334	.064
Spirituality	2.631	1.374	.339	-1.232
Zest	3.516	.800	-.504	-.069

Time 2				
	Mean	Std. Deviation	Skewness	Kurtosis
Appreciation of Beauty	3.795	.917	-0.523	-0.253
Bravery	3.738	.868	-0.542	-0.111
Love	4.087	.828	-1.143	1.381
Prudence	3.680	.825	-0.410	-0.130
Teamwork	3.714	.811	-0.517	0.003
Creativity	3.623	.754	-0.250	0.036
Curiosity	3.770	.675	-0.258	-0.207
Fairness	4.182	.647	-0.755	0.248
Forgiveness	3.520	.831	-0.413	0.205
Gratitude	4.067	.761	-1.052	1.063
Honesty	4.224	.593	-0.797	0.701
Hope	3.889	.728	-0.720	0.088
Humor	4.188	.806	-0.942	0.636
Perseverance	3.836	.824	-0.646	0.290
Judgment	4.109	.691	-0.845	1.304
Kindness	4.054	.710	-0.968	1.586
Leadership	3.885	.724	-0.415	-0.456
Love of Learning	3.723	.950	-0.445	-0.691
Humility	3.393	.816	-0.467	0.245
Perspective	3.994	.713	-0.353	-0.424
Self-Regulation	2.973	.893	0.083	-0.488
Social Intelligence	3.598	.771	-0.351	-0.236
Spirituality	2.598	1.378	0.394	-1.195
Zest	3.484	.866	-0.522	0.106

Professors. *t* tests were again used to test for value change over time.

Unexpectedly, professors' values significantly changed for 22 of the 24 subscales.

According to the FDR criterion, Kindness and Love were not found to change over time.

This again shows that professors' values are not as stable as predicted over time. Results are summarized in Table 14.

Table 14. Tests of change for professors' VIA values for Time 1 to Time 2.

Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
Appreciation of Beauty	.333	.068	.598	2.803	.019*
Bravery	.485	.232	.738	4.276	.002*
Creativity	.333	.088	.579	3.028	.013*
Curiosity	.333	.109	.557	3.317	.008*
Fairness	.212	.061	.363	3.13	.011*
Forgiveness	.242	.098	.387	3.73	.004*
Gratitude	.515	.243	.787	4.224	.002*
Honesty	.333	.033	.634	2.472	.033*
Hope	.242	.098	.387	3.73	.004*
Humility	.515	.226	.805	3.963	.003*
Humor	.227	.052	.403	2.887	.016*
Judgment	.424	.248	.600	5.369	<.001*
Kindness	.242	-.042	.527	1.896	.087
Leadership	.394	.114	.674	3.135	.011*
Love	.212	-.018	.442	2.055	.067
Love of Learning	.394	.065	.723	2.665	.024*
Perseverance	.485	.232	.738	4.276	.002*
Perspective	.394	.174	.614	3.993	.003*
Prudence	.424	.177	.671	3.825	.003*
Self-Regulation	.576	.291	.861	4.503	.001*
Social Intelligence	.303	.117	.489	3.627	.005*
Spirituality	.121	.008	.234	2.39	.038*
Teamwork	.455	.063	.846	2.588	.027*
Zest	.182	.065	.299	3.464	.006*

critical *p* values range = [.05, .0021] *significant by FDR criterion

Students. *t* tests were also used to test for students' value change over time. Value change was highly significant for all values ($p < .001$). This supports the hypothesis that students' values tend to fluctuate over time. Results are summarized in Table 15.

Table 15. Tests of change for students' VIA values for Time 1 to Time 2.

Values	Mean Absolute Difference	95% Confidence Interval of the Difference		<i>t</i> test	<i>p</i> value
		Lower	Upper		
Appreciation of Beauty	.451	.393	.513	14.548	<.001*
Bravery	.444	.382	.505	14.234	<.001*
Creativity	.463	.412	.514	17.886	<.001*
Curiosity	.457	.403	.512	16.604	<.001*
Fairness	.436	.380	.493	15.320	<.001*
Forgiveness	.484	.431	.538	17.925	<.001*
Gratitude	.407	.358	.456	16.329	<.001*
Honesty	.378	.332	.424	16.228	<.001*
Hope	.417	.366	.468	16.127	<.001*
Humility	.507	.449	.564	17.314	<.001*
Humor	.424	.358	.490	12.633	<.001*
Judgment	.484	.425	.544	16.058	<.001*
Kindness	.383	.332	.433	14.843	<.001*
Leadership	.420	.353	.487	12.332	<.001*
Love	.390	.335	.445	14.050	<.001*
Love of Learning	.463	.405	.522	15.562	<.001*
Perseverance	.448	.394	.503	16.271	<.001*
Perspective	.390	.342	.439	15.862	<.001*
Prudence	.541	.483	.599	18.423	<.001*
Self-Regulation	.463	.409	.518	16.798	<.001*
Social Intelligence	.442	.395	.490	18.348	<.001*
Spirituality	.407	.328	.485	10.212	<.001*
Teamwork	.490	.430	.551	16.015	<.001*
Zest	.474	.420	.528	17.245	<.001*

critical *p* values range = [.05, .0021] *significant by FDR criterion

These findings again only partially supported the hypothesis that professors' values would remain stable while students' values changed from Time 1 to Time 2. These findings show that both professors' and students' values are changing. However, as summarized by Table 16, students more frequently had higher mean differences, meaning their values are changing at a greater rate on more subscales than professors, Students: $\bar{D}_M = .427$, Professors: $\bar{D}_M = .348$. Out of the 24 values examined, students were found to be changing more than professors for 18 of them. A sign test was used and found again that students significantly changed more often than professors and this was greater than chance [relative frequency of greater change for students = 75%, relative frequency of greater change for professors = 25%, $p = .023$].

Table 16. Comparison of VIA mean absolute differences for professors and students.

Values	Student Mean Absolute Difference	Professor Mean Absolute Difference	Students changing more	Professors changing more
Appreciation of Beauty	.451	.333	x	
Bravery	.444	.485		x
Love	.390	.212	x	
Prudence	.541	.424	x	
Teamwork	.490	.455	x	
Creativity	.463	.333	x	
Curiosity	.457	.333	x	
Fairness	.436	.212	x	
Forgiveness	.484	.242	x	
Gratitude	.407	.515		x
Honesty	.378	.333	x	
Hope	.417	.242	x	
Humor	.424	.227	x	
Perseverance	.448	.485		x
Judgment	.484	.424	x	
Kindness	.383	.242	x	
Leadership	.420	.394	x	
Love of Learning	.463	.394	x	
Humility	.507	.515		x
Perspective	.390	.394		x
Self-Regulation	.463	.576		x
Social Intelligence	.442	.303	x	
Spirituality	.407	.212	x	
Zest	.474	.182	x	

MANOVA was also used to test the interaction between time and courses for the VIA subscales. Results from these analyses are shown in Table 17. The interaction between time and courses for all the VIA subscales were not significant indicating that change over time for this measure was not a function of courses.

Table 17. The interaction of course with Time, that is, tests are of the whether difference in students' VIA values from Time 1 to Time 2 varied across courses (dependent variable includes direction of change).

VIA		
Value	<i>F</i> (16, 198)	<i>p</i> value
Appreciation of Beauty	.76	.730
Bravery	1.72	.045
Creativity	.60	.880
Curiosity	.50	.947
Fairness	.64	.845
Forgiveness	.78	.712
Gratitude	.73	.763
Honesty	.80	.683
Hope	.89	.578
Humor	1.37	.162
Humility	.87	.607
Judgment	.92	.547
Leadership	1.55	.086
Love	1.02	.434
Love of Learning	.96	.504
Kindness	.67	.824
Perseverance	.61	.874
Perspective	.81	.669
Prudence	1.89	.023
Self-Regulation	1.98	.016
Social Intelligence	.87	.609
Spirituality	.68	.810
Teamwork	.54	.922
Zest	.60	.880

critical *p* values range = [.05, .0021] *significant by FDR criterion

Effect sizes for directional changes. It was again expected that there would be considerably less power to detect change in the professors than to detect change in the students and, hence, estimates of student's effect size would be larger than that of the professors. This again was not the case. Students' absolute value of the effect sizes for directional change (Cohen's d) ranged from .003 to .082 with a mean of .035. Professors' absolute value of effect sizes was much higher than students, ranging from 0.00 to .503, with an overall mean of .169. Effect sizes are reported in Table 18; signed values for Cohen's d are reported to indicate direction of change. As stated earlier, positive values indicate increase in values from Time 1 to Time 2 whereas negative values indicate a decrease over time. A sign test was used and found that professors had more frequent higher effect sizes than students and this was significantly greater than chance [relative frequency of higher effect sizes for professors = 83%, relative frequency of higher effect sizes for students = 17%, $p = .002$].

Table 18. Comparison of professor and student effect sizes when testing for VIA value change over time.

Values	Professors' Cohen's d^+	Students' Cohen's d^+	Professors with higher effect size	Students with higher effect size
Appreciation of Beauty	.227	-.033	x	
Bravery	-.149	.032	x	
Creativity	.050	.004	x	
Curiosity	.000	-.082		x
Fairness	-.043	-.005	x	
Forgiveness	.166	-.004	x	
Gratitude	-.357	.020	x	
Honesty	.034	-.024	x	
Hope	-.314	-.044	x	
Humility	-.274	-.003	x	
Humor	.205	.070	x	
Judgment	-.100	.017	x	
Kindness	.147	.046	x	
Leadership	-.082	-.029	x	
Love	-.113	-.033	x	
Love of Learning	.000	.007		x
Perseverance	-.285	-.019	x	
Perspective	.503	-.055	x	
Prudence	-.268	.077	x	
Self-Regulation	-.356	-.024	x	
Social Intelligence	-.120	.069	x	
Spirituality	.252	-.024	x	
Teamwork	.000	-.082		x
Zest	.000	-.038		x

Hypothesis 2: Students' attributes will influence level of BVA change.

Students were examined to see how different attributes influenced value change. It was expected that students who were younger (21 or under), had less college experience (freshman and sophomores), reported a weak adherence to values at the start of the semester, reported not being religious, or had little to no religious commitment would report higher levels of BVA change compared to their counterparts. It was also anticipated that gender would be influential and so this was added as a predictor to the model for exploratory purposes.

Two stepwise regression analyses were run to understand the strength of these six predictors: age, college year, initial commitment to values, reported religious status, levels of religious commitment, and gender. The dependent variables, GSVI absolute change and MVI absolute change, were calculated by taking the absolute difference between the average score for Time 1 and Time 2 for each of the GSVI and MVI's respective subscales and summing them to arrive at a final score of absolute change for the GSVI and for the MVI. Positive values indicated that the relationship was positive, meaning the as the predictor value increased so did value change (e.g., older students were associated with higher levels of BVA change) whereas negative values indicated that as the predictor variable increased, value change decreased (e.g., younger students were associated with lower levels of BVA change).

The first regression analysis looked at how these six variables predicted GSVI change. As shown in Table 19, initial commitment to values was found to have a significant, negative, moderately strong relationship with GSVI change, $r = -.215$, $p < .001$. Similarly, levels of religious commitment was found to have a significant, negative

but moderately weak relationship with GSVI change, $r = .120$, $p = .014$. There was also a strong, significant correlation between initial commitment and religious commitment ($r = .447$, $p < .001$), suggesting moderate multicollinearity. Therefore, the final model only used initial commitment to values. Initial commitment was found to significantly predict change in GSVI over time, $t(335) = -4.022$, $p < .001$, $R^2 = .046$. The final regression model found that for every unit increase in initial commitment, GSVI changed by $-.637$ units. Findings for all predictor variables are reported in Table 19.

Table 19. Analyses reporting how student attributes predict GSVI and MVI absolute change.

		GSVI		
		Pearson Correlation (r) with GSVI change	p value (1-tailed)	
GSVI Absolute Change+		1.000		
Age (0 = under 21yrs, 1 = 21+yrs)		-.037	.247	
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)		-.022	.341	
Initial Commitment to Values (0 = low, 1 = high)		-.215	<.001*	
Religious Status (0 = non-religious, 1 = religious)		-.078	.077	
Religious Commitment (0 = low, 1 = high)		-.120	.014*	
Gender (1 = male, 2 = female)		.057	.149	
$n = 337$; critical p values range = [.05, .008] *significant by FDR criterion				
+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale				
		Unstandardized Coefficients		
Final Model	B	Std. Error	t	p value
(Constant)	4.037	.125	32.419	<.001
Initial Commitment to Values	-.637	.159	-4.022	<.001*

Table 19 (cont). Analyses reporting how student attributes predict GSVI and MVI absolute change.

	MVI	
	Pearson Correlation (<i>r</i>) with MVI Change	<i>p</i> value (1-tailed)
MVI Absolute Change+	1.000	.
Age (0 = under 21yrs, 1 = 21+yrs)	-.036	.254
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)	-.075	.086
Initial Commitment to Values (0 = low, 1 = high)	-.242	<.001*
Religious Status (0 = non-religious, 1 = religious)	-.230	<.001*
Religious Commitment (0 = low, 1 = high)	-.232	<.001*
Gender (1 = male, 2 = female)	-.088	.055

n = 337; critical *p* values range = [.05, .008] *significant by FDR criterion

+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale

Final Model	Unstandardized Coefficients			
	<i>B</i>	Std. Error	<i>t</i>	<i>p</i> value
(Constant)	5.434	.187	29.060	<.001
Initial Commitment to Values	-.743	.215	-3.458	.001*
Religious Status (Non-religious vs. Religious)	-.675	.215	-3.133	.002*

The second analysis, which tested the relationship between the six predictors and MVI change, found that three out of the six variables to significantly relate to MVI change. Initial commitment to values, religious status, and religious commitment all had significant, negative, moderately strong relationships with MVI change: Initial commitment: $r = -.242, p < .001$; Religious status: $r = -.230, p < .001$; Religious commitment; $r = .232, p < .001$. There was also strong, significant correlation between religious status and religious commitment ($r = .648, p < .001$) as well as between initial commitment and religious commitment ($r = .460, p < .001$), suggesting moderate multicollinearity. The final model used initial commitment to values and religious status as predictors for MVI change. Initial commitment was found to significantly predict

change in GSVI over time, $t(328) = -3.458, p = .001$. Similarly, religious status was also found to predict change in GSVI over time, $t(328) = -3.133, p = .002$. The final regression model found that for every unit increase in initial commitment, MVI change decreased by $-.743$ units, and for every unit increase in religious status, MVI change decreased by $-.675$ units. Overall, the model with both predictors accounted for a relatively small amount of the variance, $R^2 = .086$.

All predictors had a negative correlation supporting the hypothesis that higher levels of change were related to lower levels of values commitment. Interestingly, the student attributes related to stage in life such as age and year in college as well as gender were not indicative of value change. Instead, the variables related to students' commitment to values and religious beliefs were strongly related to value change.

A test for the heterogeneity of regression found that the interaction was significant between class type and initial commitment to values, $F(1, 331) = 20.175, p = .002$, as well as between class type and religious status, $F(1, 331) = 10.656, p = .040$. This indicated that there were significant differences in the predictive strength of these two variables between values based and non-values based classes. Unexpectedly, initial commitment to values and religious status were stronger predictors for non-values based classes rather than for values-based classes. Hence, follow up analyses were conducted to see if the six predictors affected GSVI and MVI change differently for values and non-values based classes. Regression analyses using the six predictors were first conducted using the data from values-based classes for the GSVI and MVI scores. The same analyses were then conducted for the non-values based classes' data.

For the values-based classes, only initial commitment to value had a significant, negative, moderately strong, relationship with GSVI change, $r = -.173$, $p = .004$. For every unit increase in initial commitment, GSVI change significantly decreased by $-.523$, $t(228) = -2.653$, $p = .009$, $R^2 = .030$. Initial commitment to values, religious status, and religious commitment were all found to have significant, negative, moderately strong relationships with MVI change: Initial commitment to values: $r = -.209$, $p = .001$; Religious status: $r = -.214$, $p = .001$; Religious commitment: $r = -.250$, $p < .001$. The final model only included religious commitment. This was primarily because initial commitment and religious commitment were strongly related ($r = .396$, $p < .001$), and religious commitment the strong relationship with MVI change. Religious commitment significantly predicted MVI change, $t(228) = -3.901$, $p < .001$, $R^2 = .063$. As hypothesized, lower levels of religious commitment predicted higher levels of MVI change. For every unit increase in religious commitment, MVI change decreased by $-.988$ units. Results are summarized in Table 20.

Table 20. Analyses reporting how student attributes predict GSVI and MVI absolute change in values based classes.

GSVI		
	Pearson Correlation (<i>r</i>) with GSVI change	<i>p</i> value (1-tailed)
GSVI Absolute Change+	1.000	
Age (0 = under 21yrs, 1 = 21+yrs)	-.087	.094
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)	-.089	.090
Initial Commitment to Values (0 = low, 1 = high)	-.173	.004*
Religious Status (0 = non-religious, 1 = religious)	-.097	.072
Religious Commitment (0 = low, 1 = high)	-.100	.065
Gender (1 = male, 2 = female)	.071	.141

n = 230; critical *p* values range = [.05, .008] *significant by FDR criterion

+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale

Unstandardized Coefficients				
Final Model	<i>B</i>	Std. Error	<i>t</i>	<i>p</i> value
(Constant)	4.032	.160	25.241	<.001
Initial Commitment to Values	-.523	.197	-2.653	.009*

MVI		
	Pearson Correlation (<i>r</i>) with MVI Change	<i>p</i> value (1-tailed)
MVI Absolute Change+	1.000	.
Age (0 = under 21yrs, 1 = 21+yrs)	-.041	.266
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)	-.112	.045
Initial Commitment to Values (0 = low, 1 = high)	-.209	.001*
Religious Status (0 = non-religious, 1 = religious)	-.214	.001*
Religious Commitment (0 = low, 1 = high)	-.250	<.001*
Gender (1 = male, 2 = female)	-.101	.064

n = 230; critical *p* values range = [.05, .008] *significant by FDR criterion

+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale

Unstandardized Coefficients				
Final Model	<i>B</i>	Std. Error	<i>t</i>	<i>p</i> value
(Constant)	5.185	.198	26.228	<.001
Religious Commitment	-.988	.253	-3.901	<.001*

For non-values classes, findings were similar to the overall regression analyses. Initial values to commitment and religious commitment again were the only predictors to significantly predict GSVI change: Initial commitment: $r = -.320, p < .001$; Religious commitment: $r = -.196, p = .022$. The relationship between initial commitment and GSVI change was strong ($r = -.320$), whereas the relationship between religious commitment and GSVI change was fairly weak, $r = -.196$, so only initial commitment was included in the final model. Initial commitment was found to significantly predict GSVI change, $t(105) = -3.463, p = .001, R^2 = .103$. GSVI decreased by $-.935$ for every unit increase in initial commitment. For MVI change, initial commitment to values, religious status, and religious commitment again had strong, negative, significantly relationships with MVI change: Initial commitment: $r = -.336, p < .001$; Religious status: $r = -.280, p = .002$; Religious commitment: $r = -.215, p = .016$. MVI scores significantly decreased by $-.995$ for every unit increase in initial commitment ($t(98) = -2.825, p = .006$), and significantly decreased by $-.706$ for every unit increase in religious status ($t(98) = -2.001, p = .048$). The final model with these two predictors accounted for a moderately large part of the variance, $R^2 = .148$. Results are displayed in Table 21.

Table 21. Analyses reporting how student attributes predict GSVI and MVI absolute change in non-values based classes.

GSVI		
	Pearson Correlation (<i>r</i>) with GSVI change	<i>p</i> value (1-tailed)
GSVI Absolute Change+	1.000	
Age (0 = under 21yrs, 1 = 21+yrs)	.074	.223
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)	.083	.199
Initial Commitment to Values (0 = low, 1 = high)	-.320	<.001*
Religious Status (0 = non-religious, 1 = religious)	-.062	.264
Religious Commitment (0 = low, 1 = high)	-.196	.022*
Gender (1 = male, 2 = female)	-.005	.482

n = 337; critical *p* values range = [.05, .008] *significant by FDR criterion

+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale

Unstandardized Coefficients				
Final Model	<i>B</i>	Std. Error	<i>t</i>	<i>p</i> value
(Constant)	4.045	.197	2.521	<.001
Initial Commitment to Values	-.935	.270	-3.463	.001*

MVI		
	Pearson Correlation (<i>r</i>) with MVI Change	<i>p</i> value (1-tailed)
MVI Absolute Change+	1.000	
Age (0 = under 21yrs, 1 = 21+yrs)	-.023	.412
Year in Undergraduate (0 = 1 st or 2 nd year, 1 = 3 rd year+)	-.012	.453
Initial Commitment to Values (0 = low, 1 = high)	-.336	<.001*
Religious Status (0 = non-religious, 1 = religious)	-.280	.002*
Religious Commitment (0 = low, 1 = high)	-.215	.016*
Gender (1 = male, 2 = female)	-.093	.177

n = 337; critical *p* values range = [.05, .008] *significant by FDR criterion

+calculated by summing the absolute difference between the average score for Time 1 and Time 2 for each subscale

Unstandardized Coefficients				
Final Model	<i>B</i>	Std. Error	<i>t</i>	<i>p</i> value
(Constant)	5.393	.277	19.487	<.001
Initial Commitment to Values	-.995	.352	-2.825	.006*
Religious Status (Non-religious vs. Religious)	-.706	.353	-2.001	.048*

Overall, student attributes predicted value change but only initial commitment to values was a robust predictor for GSVI change. Initial commitment and religious commitment were robust predictors for MVI change. As hypothesized, students in both values and non-values classes who had lower levels of initial commitment of values and less religious commitment were more susceptible to value change.

Hypothesis 3: Students assimilate to their professor's BVAs. To examine value assimilation, the RVS ranking scores for instrumental and terminal values at Time 1 and 2 for professors and each of their students were used. Each student's RVS ranked value position was noted separately for the 18 terminal and 18 instrumental values, for Time 1 and Time 2. These value ranks were then correlated with the professor's ranking. Thus, four correlations were computed for each student with their professor's values: correlations of their instrumental values with their professor's at the beginning of the semester, correlations of their instrumental values with their professor's at the end of the semester, correlations of their terminal values with their professor's at the beginning of the semester, and correlations of their terminal values with their professor's at the end of the semester. It was predicted that change over time would be different between courses and class type (values vs. non-values), that is, the interaction would be significant in a between x within ANOVA of the correlations. It was also expected that mean correlations would increase significantly over time, that is, the main effect of the within-subject factor of time would be significant. Correlations were transformed using Fisher's r to z transformation before analysis. Box's M found that for all tests the observed covariance matrices of the dependent variables were equal across groups ($p > .05$).

To again account for students nested in classes, a mixed model analysis was used to determine if differences between classes influenced the relationship between professors' and students' terminal and instrumental values. The intraclass correlation coefficients (ICCs) were calculated to determine if nesting should be accounted for in the analysis. For the relationship between professors' and students' terminal values, 13.00% of the observed variance was due to differences between classes. For the relationship between professors' and students' instrumental values, 6.16% of the observed variance was due to differences between classes. The ICCs indicated heterogeneity between classes so nested model analyses were used. Course code was used as random nested factors to account for differences between classes.

Courses. MANOVA was used to test the interaction between time and courses for the relationships between professors' and students' terminal and instrumental values. The difference was calculated between the professor-student relationship by subtracting Time 1 from Time 2 for both terminal values and instrumental values. The difference was used as the dependent variable.

For the relationship between professors' and students' terminal values, courses were found to significantly impact value assimilation over time, that is, the course x time interaction was significant, $F(17, 329) = 3.61, p < .001$ (see Figure 6). The difference in mean change in correlations between values-based courses and non-values based course did not approach significance, $F(1, 17) = 0.01, p = .916$ (see Figure 7), nor did the test of overall change from Time 1 to Time 2 approach significance, $F(1, 17) = 0.62, p = .443$. Follow up analyses for the significant interaction of course x time revealed that there were significant differences in the amount of change over time for both values-based

courses, $F(10, 329) = 4.23, p < .001$, and non-values based courses, $F(7, 329) = 2.73, p = .009$.

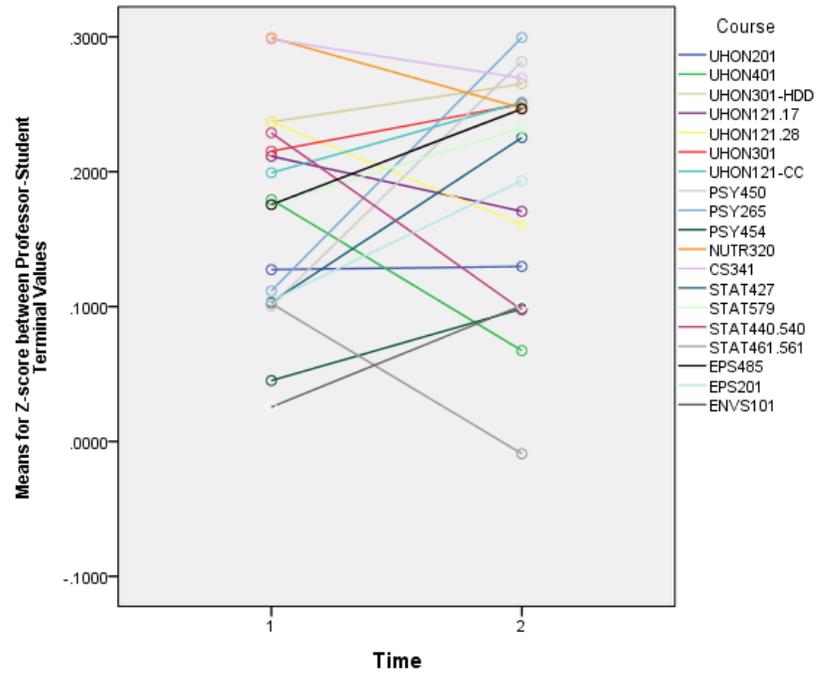


Figure 6. The relationship between professors' and students' terminal values significantly differed across classes over time.

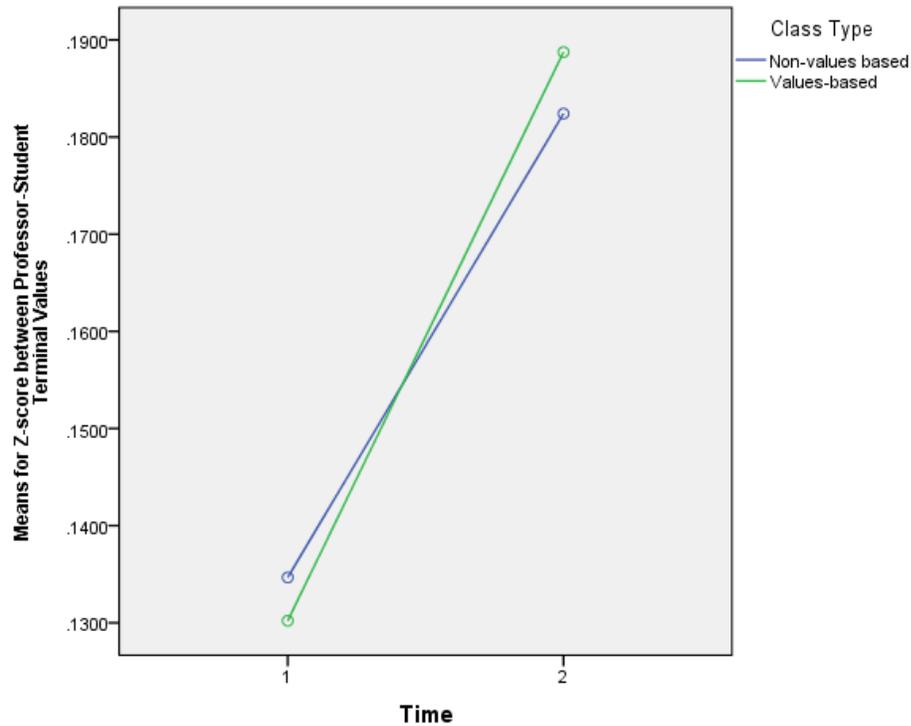


Figure 7. The relationship between professors' and students' terminal values significantly differed for values-based and non-values based classes over time.

Contrast analyses for values-based classes found that there was a significant difference between psychology and Honors courses. More specifically, psychology showed greater increase than the Honors college [Psychology: $\bar{D}_M = .108$, Honors: $\bar{D}_M = -.013$, $F(1, 329) = 18.99$, $p < .001$]. As in Hypothesis 1, mean differences were calculated by subtracting the Time 1 mean from the Time 2 mean so that positive differences indicated an endorsement of that value, and negative differences indicated a decrease. Also, psychology courses showed significant differences in amount of change, $F(2, 329) = 7.31$, $p = .001$. There was not a significant difference between PSY265 and PSY450 ($p > .05$), which were taught by the same professor, but there was a significant difference between PSY265+PSY450 with PSY454, $F(1, 329) = 10.84$, $p = .001$. PSY265 and

PSY450 both showed large increases over time whereas PSY454 showed a slight increase: PSY265+PSY450: $\bar{D}_M = .184$, PSY454: $\bar{D}_M = .053$.

Contrast analyses for non-values based classes found a significant difference among the Statistics & Math courses, $F(3, 329) = 4.99, p = .002$. STAT440 + STAT461, which were taught by the same professor were significantly different than STAT427 + STAT579, which were also both taught by the same professor, $F(1, 329) = 9.72, p = .002$. The relationship between the professor and students' terminal values greatly decreased for STAT440+STAT461 over time but moderately increased for STAT427+STAT579: STAT440+STAT451: $\bar{D}_M = -.121$, STAT427+STAT579: $\bar{D}_M = .089$. Department and course differences over time are reported in Tables 22 and 23, respectively.

Table 22. Change in the relationship between professors' and students' terminal values overall from Time 1 to Time 2 for departments.

Department	Mean Difference* (\bar{D}_M)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
Honors	-.013	1	.200	.026	.150	.251
		2	.187	.026	.135	.238
Psychology	.108	1	.072	.017	.039	.104
		2	.180	.017	.146	.213
Education	-.052	1	.299	.040	.220	.379
		2	.247	.041	.166	.329
Computer Science	-.029	1	.298	.051	.197	.399
		2	.269	.052	.166	.372
Math & Statistics	.031	1	.132	.028	.077	.187
		2	.163	.029	.107	.220
Earth & Planetary Science	.084	1	.124	.031	.063	.184
		2	.208	.032	.145	.270
Environmental Science	.075	1	.026	.048	-.069	.120
		2	.101	.049	.004	.198

*Mean difference = Time 2 minus Time 1

Table 23. Change in the relationship between professors' and students' terminal values overall from Time 1 to Time 2 for individual courses.

Course	Mean Difference* (\bar{D}_M)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
UHON201	.003	1	.127	.066	-.003	.258
		2	.130	.064	.005	.255
UHON401	-.112	1	.179	.063	.056	.303
		2	.067	.060	-.051	.186
UHON301-HDD	.028	1	.237	.055	.128	.345
		2	.265	.053	.161	.369
UHON121.17	-.040	1	.211	.070	.073	.350
		2	.171	.067	.038	.303
UHON121.28	-.076	1	.237	.089	.062	.412
		2	.161	.085	-.007	.328
UHON301	.035	1	.215	.066	.085	.346
		2	.250	.064	.125	.375
UHON121-CC	.052	1	.199	.081	.039	.359
		2	.251	.078	.099	.404
PSY450	.181	1	.101	.057	-.012	.213
		2	.282	.055	.174	.390
PSY265	.187	1	.112	.029	.054	.169
		2	.299	.028	.244	.355
PSY454	.053	1	.045	.022	.002	.088
		2	.098	.021	.057	.140
NUTR320	-.052	1	.299	.041	.219	.379
		2	.247	.039	.171	.324
CS341	-.029	1	.298	.051	.197	.399
		2	.269	.049	.173	.366
STAT427	.122	1	.103	.038	.028	.178
		2	.225	.037	.153	.297
STAT579	.056	1	.176	.081	.016	.336
		2	.232	.078	.079	.385
STAT44.540	-.131	1	.229	.070	.091	.367
		2	.098	.067	-.035	.230
STAT461.561	-.111	1	.102	.066	-.028	.233
		2	-.009	.064	-.134	.116
EPS485	.071	1	.176	.060	.058	.294
		2	.247	.057	.134	.360
EPS201	.089	1	.104	.036	.033	.176
		2	.193	.035	.125	.262
ENVS101	.075	1	.026	.048	-.069	.120
		2	.101	.046	.010	.192

Mean difference = Time 2 minus Time 1

Courses were also found to significantly impact value assimilation over time for the relationship between professors' and students' instrumental values, $F(17, 328) = 2.13$, $p = .006$ (see Figure 8).

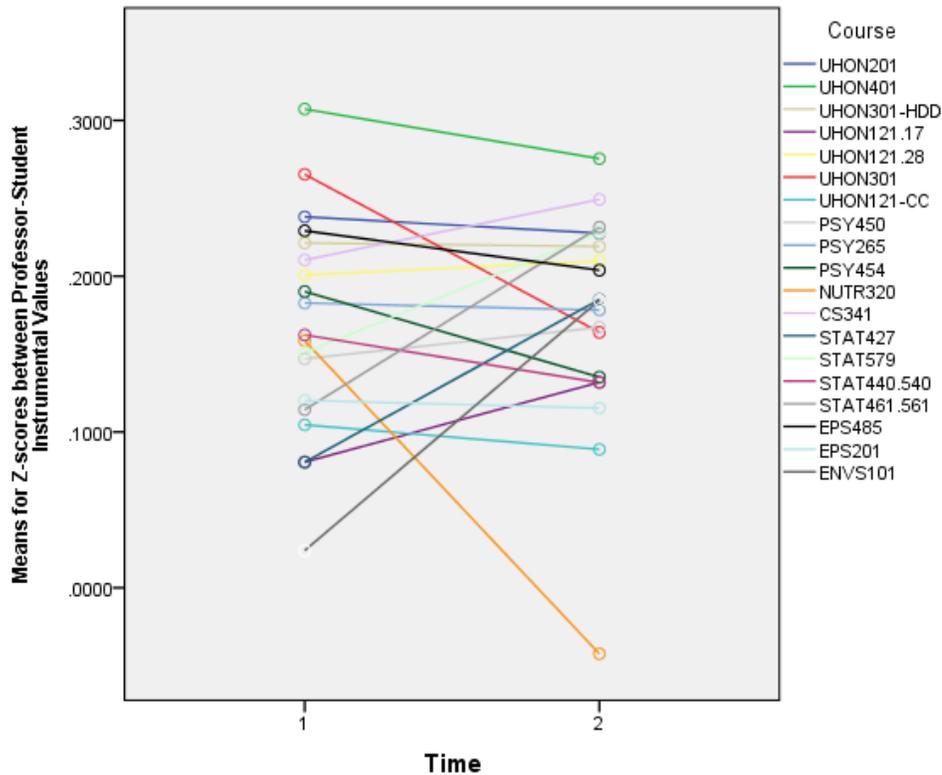


Figure 8. The relationship between professors' and students' instrumental values significantly differed across classes over time.

In addition, the main effect of type of class on amount of change in correlations was significant, $F(1, 17) = 4.55$, $p = .048$. As suggested by Figure 8, although non-values classes tended to start with lower student-professor correlations, the overall increase in student-professor correlations in the non-values based classes, $\bar{D}_M = .054$, was greater than that in the values based classes, where the mean correlations actually declined, $\bar{D}_M = -.031$. Follow up analyses of the significant course x time interactions found that there were significant differences in the amount of change over time for values-based courses,

$F(10, 328) = 2.23, p = .016$, but the non-values based only approached significance, $F(7, 328) = 1.99, p = .056$ (see Figure 9).

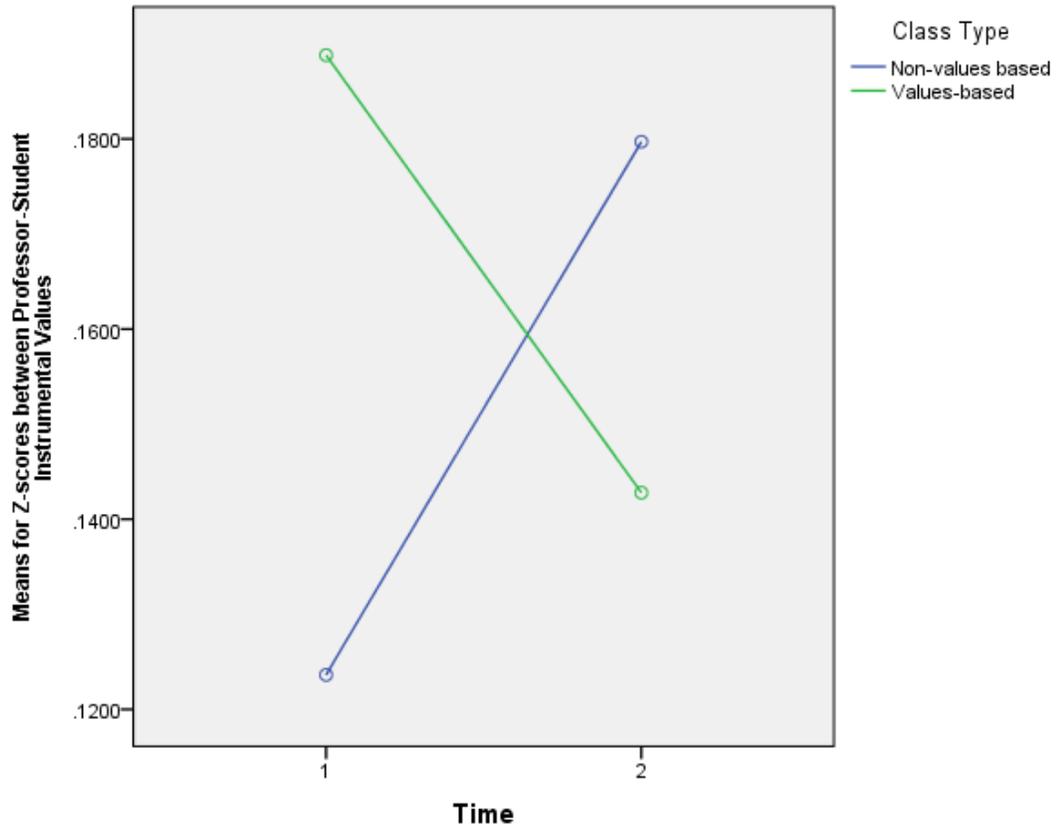


Figure 9. The relationship between professors' and students' instrumental values significantly differed for non-values based classes over time, but not for values based classes.

Contrast analyses for values-based classes found that there was a significant difference between education courses and psychology + Honors courses. Surprisingly, all the departments showed a decrease over time, but education showed greater decrease than the psychology + Honors college, [Education: $\bar{D}_M = -.201$, Psychology+Honors: $\bar{D}_M = -.014, F(1, 328) = 17.26, p < .001$]. Department differences over time are reported in Table 24. Course differences over time are reported in Table 25.

These findings suggest that both departments and individual classes impact value assimilation as well as dissimulation.

Table 24. Change in the relationship between professors' and students' instrumental values overall from Time 1 to Time 2 for departments.

Department	Mean Difference* (\bar{D}_M)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
Honors	-.015	1	.212	.024	.165	.259
		2	.197	.022	.152	.241
Psychology	-.032	1	.184	.015	.154	.215
		2	.152	.015	.123	.181
Education	-.201	1	.159	.037	.085	.232
		2	-.042	.035	-.112	.027
Computer Science	.039	1	.210	.047	.117	.303
		2	.249	.045	.162	.337
Math & Statistics	.082	1	.108	.026	.057	.159
		2	.190	.024	.142	.238
Earth & Planetary Science	-.01	1	.151	.028	.096	.207
		2	.141	.027	.088	.193
Environmental Science	.161	1	.024	.044	-.063	.111
		2	.185	.042	.102	.267

*Mean difference = Time 2 minus Time 1

Table 25. Change in the relationship between professors' and students' instrumental values overall from Time 1 to Time 2 for individual courses.

Course	Mean Difference* (\bar{D}_M)	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
UHON201	-.010	1	.238	.061	.119	.358
		2	.228	.058	.114	.341
UHON401	-.032	1	.307	.058	.194	.421
		2	.275	.055	.168	.383
UHON301-HDD	-.002	1	.221	.051	.122	.321
		2	.219	.048	.125	.313
UHON121.17	.051	1	.081	.064	-.046	.207
		2	.132	.061	.012	.252
UHON121.28	.009	1	.201	.082	.040	.361
		2	.210	.077	.058	.362
UHON301	-.101	1	.265	.064	.139	.392
		2	.164	.061	.044	.284
UHON121-CC	-.016	1	.105	.074	-.042	.251
		2	.089	.070	-.050	.227
PSY450	.020	1	.147	.055	.039	.255
		2	.167	.052	.065	.270
PSY265	-.005	1	.183	.027	.130	.236
		2	.178	.025	.128	.228
PSY454	-.055	1	.190	.020	.151	.229
		2	.135	.019	.098	.172
NUTR320	-.201	1	.159	.037	.085	.232
		2	-.042	.035	-.112	.027
CS341	.039	1	.210	.047	.118	.303
		2	.249	.045	.162	.337
STAT427	.104	1	.081	.035	.012	.150
		2	.185	.033	.120	.250
STAT579	.077	1	.151	.074	.004	.297
		2	.228	.070	.089	.366
STAT44.540	-.030	1	.162	.064	.036	.289
		2	.132	.061	.012	.252
STAT461.561	.117	1	.114	.061	-.005	.234
		2	.231	.058	.118	.345
EPS485	-.025	1	.229	.053	.126	.333
		2	.204	.050	.106	.302
EPS201	-.005	1	.120	.033	.055	.186
		2	.115	.032	.053	.177
ENVS101	.161	1	.024	.044	-.063	.111
		2	.185	.042	.102	.267

Mean difference = Time 2 minus Time 1

Profile analysis. To further test if value assimilation occurs, a multivariate analysis was used to examine the difference between professors' and students' BVAs for values-based and non-values based courses. Profile analyses were conducted for the GSVI and the MVI subscales. Profile analyses look at three different dimensions: parallelism, levels, and flatness. Parallelism looks at whether subgroups (professors vs. students; values vs. non-values based courses) differ by varying amounts for specific values dimensions. The levels test examines if the overall endorsement of values is different between subgroups (professors vs. students; values vs. non-values based courses). Flatness indicates if there are varying degrees of value endorsement across subscales, averaging for both professors and students. It was expected that professors' and students' values would become more similar over time and that values-based classes would show more value convergence over time than the non-values classes. Hence, the four way interaction between Time, Participant type, Class type, and Values subscales was tested. It was also expected that professors' and students' in general would converge in their values over time. The relationship between Participant type, Time, and Value subscales was tested. Values-based classes were anticipated to have higher value over time than non-values based classes, so the Class type x Time x Values subscales interaction was also tested. Wilks's Lambda criterion was used based on guidance from Tabachnick and Fidell (2013). Profile analyses were conducted, first for the GSVI subscales and then for the MVI subscales.

GSVI. The first analysis examined the profile for GSVI subscale scores between professors and students for values and non-based classes over time. The four-way interaction between class type (values vs. non-values) and participant type (professors vs.

students) for GSVI subscales over time was not significant, $F(8, 399) = 1.045, p = .402$, indicating that GSVI values did not change over time as a function of both participant type and class type. Both the three-way interactions between Time, Class type, and GSVI subscale and the three way interaction between Time, Participant type, and GSVI subscale were also, unexpectedly, not found to be significant, $p > .05$. This suggests that, contrary to predictions, change over time for GSVI subscales was not occurring as a function of class type [$F(8, 401) = .434, p = .901$] or of participant type [$F(8, 401) = .903, p = .514$].

The primary hypothesis was that that professors' and students' GSVI values would change over time due to value convergence. The levels test found that professors' and students' values significantly differed, $F(1, 408) = 4.038, p = .045$. Value convergence would be demonstrated through the nature of change over time, meaning that professors' and students' values would significantly differ at the start of the semester and then not be significantly different at the end of the semester. The contrary was found: at Time 1, the mean GSVI value averaging across subscales were not significantly different, [$F(1, 423) = 2.011, p = .157$] between professors and students, but they were significantly different in levels at Time 2, [$F(1, 410) = 6.646, p = .010$]. Similarly, as displayed in Figure 10, the test of the simple two-way interaction of Participant type by GSVI subscale was not significant at Time 1, [$F(8, 416) = 1.059, p = .391$] but at Time 2 it was significant, [$F(8, 403) = 2.211, p = .026$]. This suggests divergence between professors' and students' in GSVI values over time rather than convergence.

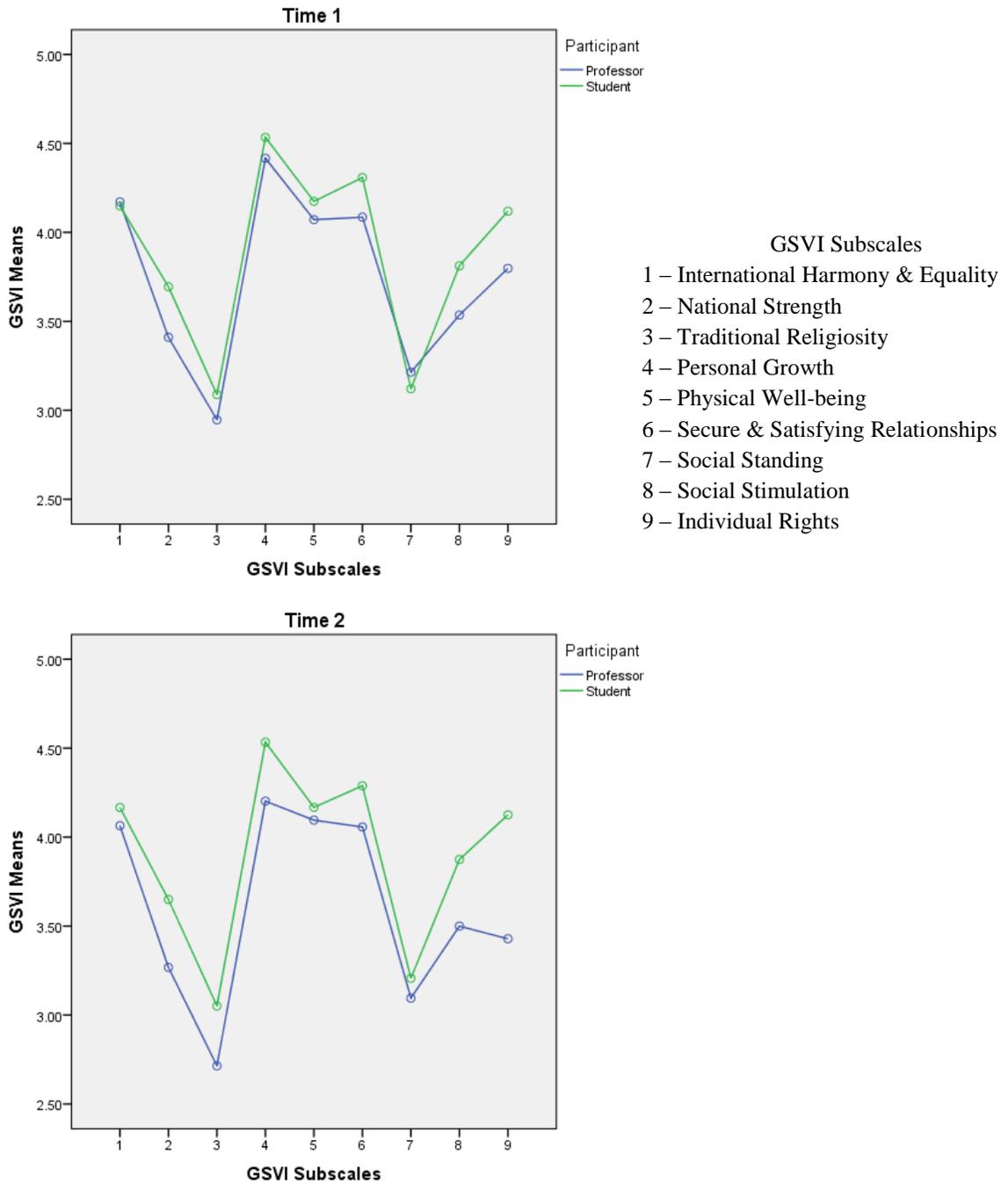


Figure 10. Significant difference in GSVI subscale means between professors and students at Time 2, but not at Time 1.

MVI. Next, the *MVI* subscale scores between professors and students for values and non-based classes over time were examined. The four-way interaction between class type (values vs. non-values) and participant type (professors vs. students) for *MVI* subscales over time was not significant, $F(9, 393) = .839, p = .581$, indicating that *MVI* values did not change over time as a function of participant type and class type. The three-way interactions for both Time, Class type, and *GSVI* subscale and the three way interaction for Time, Participant type, and *MVI* subscale were again not found to be significant, $p > .05$. This suggests that, contrary to predictions, change over time for *MVI* subscales was not occurring as a function of class type [$F(9, 395) = 1.160, p = .320$] or of participant type [$F(9, 395) = .693, p = .693$].

It was again expected that professors' and students' *MVI* values would change over time due to value convergence. The levels test found that professors' and students' values did not significantly differ, $F(1, 403) = 2.691, p = .102$. Again contrary to expectations, the mean *MVI* value averaging across subscales was significantly different between professors and students at both Time 1 [$F(1, 409) = 5.496, p = .020$] and at Time 2 [$F(1, 410) = 12.665, p < .001$]. Similarly, as shown in Figure 11, the test of the simple two-way interaction of Participant type by *MVI* subscale was not significant at Time 1, [$F(9, 411) = 1.686, p = .090$] but did significantly differ at Time 2 [$F(9, 401) = 2.360, p = .013$]. This again suggests divergence between professors' and students' in *MVI* values over time rather than convergence.

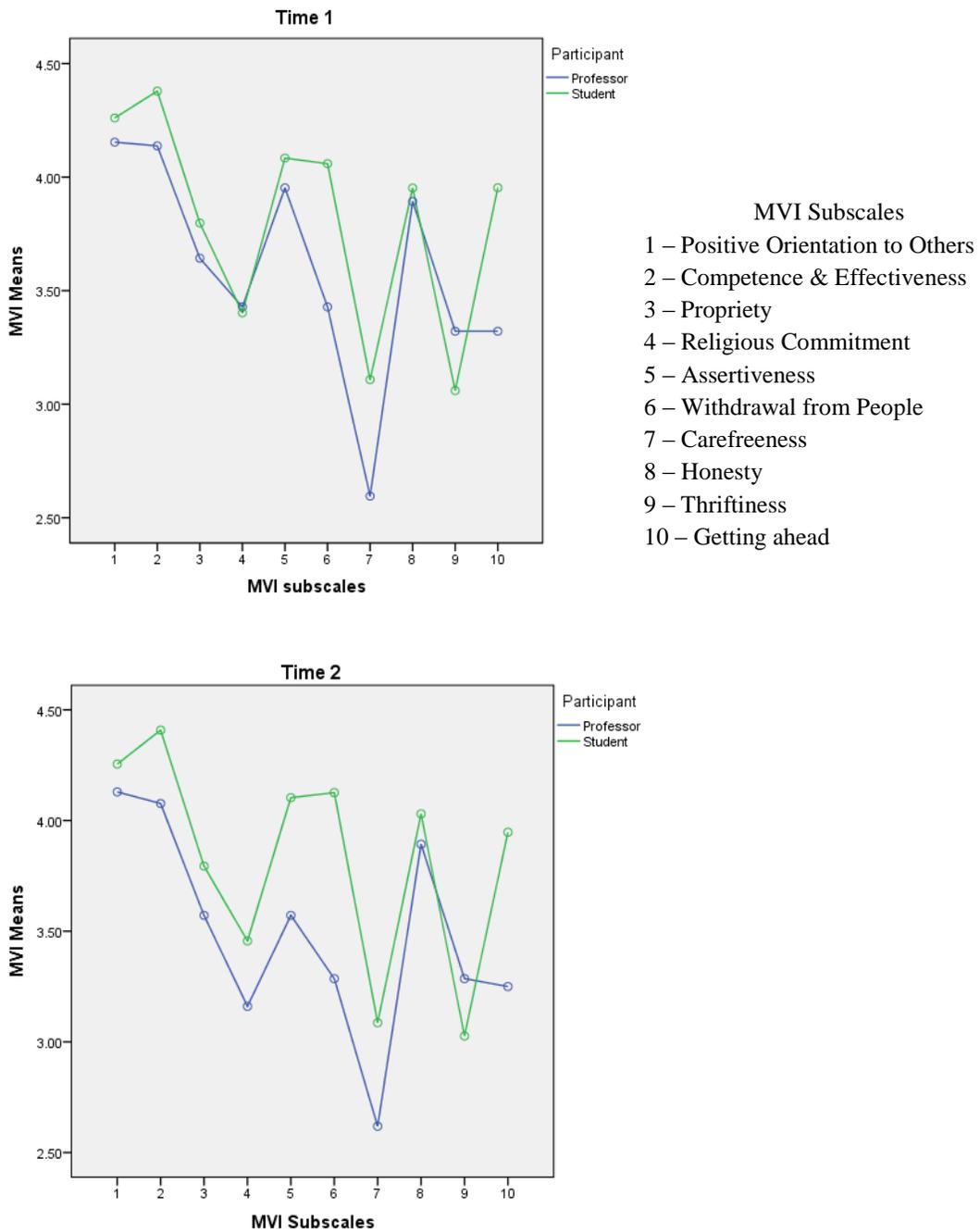


Figure 11. Significant difference in MVI subscale means between professors and students at Time 2, but not at Time 1

Teaching Efficacy Beliefs Scale. To investigate if participants' beliefs about the professors' teaching influenced value assimilation, participants were split into categories based on the Teacher Self-Efficacy Beliefs Scale (TEBS). Participants who score above the median on the Teacher Self-Efficacy Beliefs Scale (TEBS, Median = 3.387) were labeled as having a "high efficacy belief" towards the professors' teaching capabilities and those who were below the median on the TEBS were labeled as having a "low efficacy belief." In a between x within subjects design, the Rokeach Value Survey terminal and instrumental values were used as the dependent variables and beliefs about professors' self-efficacy were used as an additional blocking variable.

Terminal values were found to change over time differently between class types, influenced by whether participants' beliefs about professors' efficacy were high or low, that is, the three-way interaction of Time x Class type x TEBS category was significant, $F(1, 342) = 4.197, p = .041, \eta^2 = .012$. Follow up analyses were used to investigate the differences between class types. There were two expectations: 1) terminal values in the values-based classes would show higher levels of assimilation for the high professors' efficacy beliefs group than the low professors' efficacy beliefs, and 2) value assimilation between professors and students would be limited in the non-values based classes and there would be no difference between the efficacy groups.

Follow up analyses found that, contrary to expectations, the interaction between TEBS x Time was not significant for values-based classes [$F(1, 342) = .653, p = .420$], indicating that participants' efficacy beliefs did not influence change in the relationship between professors' and students' terminal values over time. However, the interaction between TEBS x Time was significant for non-values based classes, $F(1, 342) = 3.913, p$

= .049. As shown in Figure 12, those who reported a low TEBS score did not show much change over time while the students who rated their professor as having high efficacy beliefs increased their alignment with their professor's terminal values over the semester.

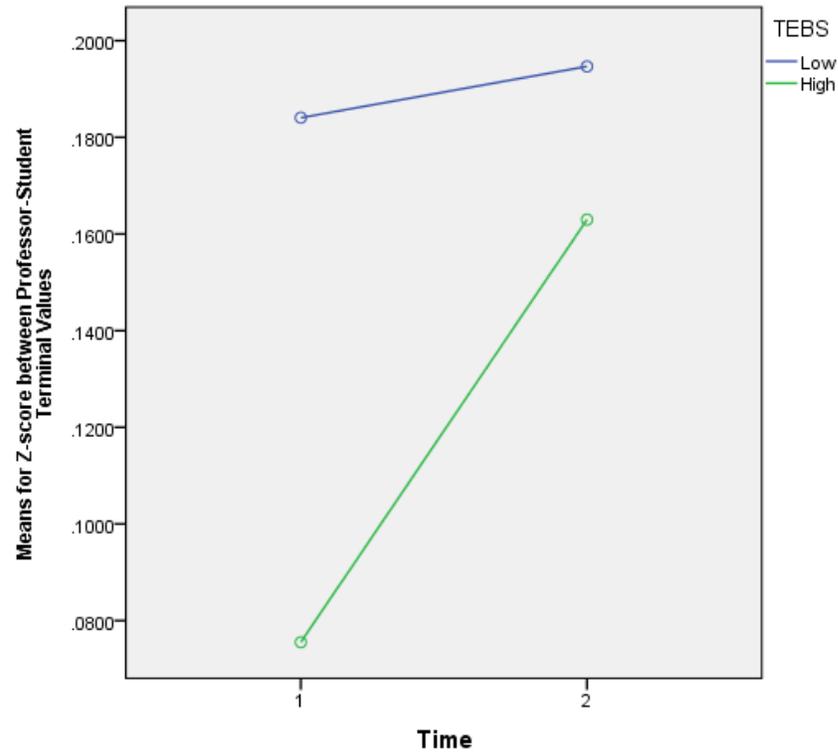


Figure 12. Non-values based classes showed a significant interaction between TEBS and Time: increase in terminal values for students who reported a high TEBS score with little to no change for those with a low TEBS score.

The main effect of time was significant for both class types. The relationship between students and professors terminal values for values-based classes significantly increased from Time 1 to Time 2, $\bar{Z}_{MTime1} = .129$, $\bar{Z}_{MTime2} = .187$, $F(1, 222) = 17.743$, $p < .001$, $\eta^2 = .074$ (see Figure 13). Similarly, the relationship between students' and professors' terminal values also significantly increased for non-values based classes,

$\bar{Z}_{MTime1} = .132, \bar{Z}_{MTime2} = .179, F(1, 120) = 5.251, p = .024, \eta^2 = .042$. This is displayed in Figure 14. This is consistent with the methodology and findings of Schwehn and Schau (1990, see Figure 1) which shows clinicians' and clients' terminal values assimilating over time.

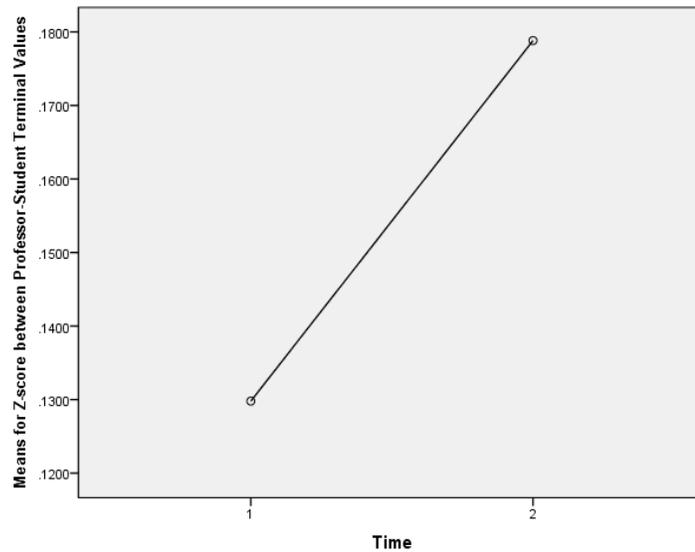


Figure 13. The relationship between students and professors terminal values for values-based classes significantly increased from Time 1 to Time 2.

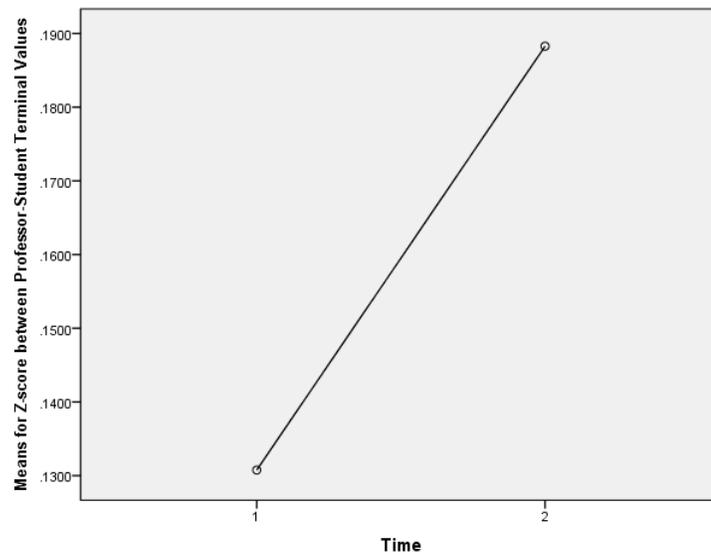


Figure 14. The relationship between students and professors terminal values for non-values based classes significantly increased from Time 1 to Time 2.

For instrumental values, values were found to change over time differently between class types and were influenced by whether participants' beliefs about teaching efficacy were high or low, meaning that the three way interaction was again significant, $F(1, 341) = 12.082, p = .001, \eta^2 = .034$. Follow up tests found that the interaction between TEBS and Time for values-based classes was again, unexpectedly, not significant, $F(1, 341) = 2.10, p = .148, \eta^2 = .010$. Also, again unexpected, the non-values classes did show a significant interaction between TEBS and Time, $F(1, 341) = 10.45, p = .001, \eta^2 = .073$. As shown in Figure 15, those who had low beliefs about their professor's efficacy did not show much change over time in the relationship between students' and professors' instrumental values, $\bar{Z}_{MTime1} = .159, \bar{Z}_{MTime2} = .161$; there was an increase over time in the relationship between students' and professors' instrumental values for students who reported a having high beliefs about their professor's efficacy, $\bar{Z}_{MTime1} = .083, \bar{Z}_{MTime2} = .202$.

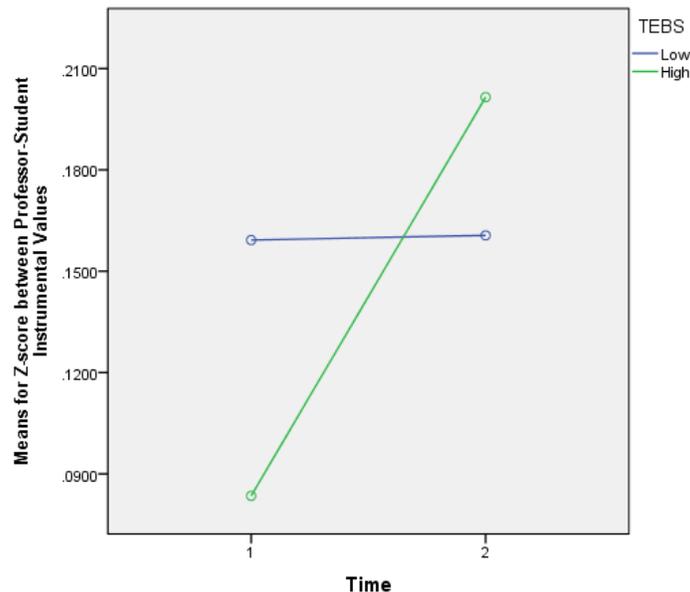


Figure 15. Non-values based classes showed a significant interaction between TEBS and Time: increase in instrumental values for students who reported a high TEBS score with little to no change for those with a low TEBS score.

The main effect of Time was investigated for the values-based classes and was significant, $F(1, 222) = 14.106, p < .001$. Surprisingly, the relationship between students' and professors' instrumental values decreased over time, $\bar{Z}_{MTime1} = .190, \bar{Z}_{MTime2} = .142$. This is shown in Figure 16.

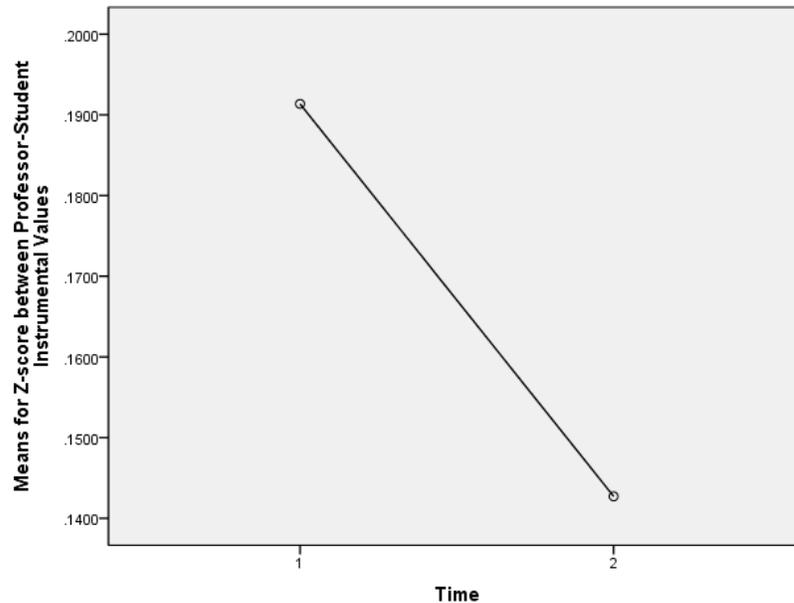


Figure 16. The relationship between students and professors instrumental values for values-based classes significantly decreased from Time 1 to Time 2.

These findings are both inconsistent and consistent with the findings from Schwehn and Schau (1990, see Figure 1). The relationship between professors' and students' instrumental values in the values-based classes did not show convergence but rather divergence over time. The non-values based classes demonstrated assimilation over time but mainly for those who thought highly of the professors' teaching ability.

Students in the non-values based classes were, contrary to expectations, found to significantly assimilate to their professor's values over the course of the semester for both terminal and instrumental values. This could be because students in non-values based

classes reported lower values at the start of the semester than values-based classes and had more room to change over time, especially the students who had high positive beliefs about their professor's teaching efficacy.

Overall, for broader sets of values: the collective set of GSVI subscales, the collective set of MVI subscales, terminal values, and instrumental values, there was not as much value assimilation as expected between professors and students. This may be because, contrary to the clinicians in the Schwehn and Schau (1990) study, professors' values were found to significantly change over time. With both professors' and students' value systems changing over time, it is difficult for students' to assimilate to their professors' values.

The analyses so far for Hypothesis 3 have investigated value assimilation for broad sets of values. The following analyses investigate if value assimilation occurred on specific value dimensions.

Value assimilation for individual values. Correlation analyses were used to investigate value assimilation between professors and students for specific values, as measured by the GSVI and MVI subscales. A summary score for the professor and class was calculated for each course. The change in professor and students' values over time (Time 2 summary score minus Time 1 summary score) was also calculated for each subscale. Pearson correlation coefficients were calculated. If the relationship between students' values and professors' values at Time 1 was not significant but was significant at Time 2, this would indicate value assimilation. Similarly, if the change in students' values over time correlated with professors' overall values, a positive relationship would also indicate assimilation.

As shown in Table 26, the relationship between professors' and students' religious commitment at Time 1 was very weak ($r_z = .037$). At Time 2, there was a positive, strong, significant relationship ($r_z = .492, p = .033$). The delta from Time 1 to Time 2 in value convergence was .455. The change in students' religious commitment values from Time 1 to Time 2 was also found to be significantly and positively correlated to professor's religious commitment at Time 2 ($r_z = .588, p = .008$). Similarly, professors' level of traditional religiosity was found to be a significant predictor of students' change in religious commitment ($r_z = .519, p = .023$) and students' overall religious commitment ($r_z = .477, p = .039$). Professors' overall religious commitment was also found to be a predictor for students' change in religious commitment ($r_z = .604, p = .006$). These findings clearly demonstrate the influence of professors' religious beliefs and values on students' religious beliefs and values.

Table 26. Correlations between professors' and students' religiosity demonstrating value assimilation (p value in parentheses).

	Professor Religious Commitment at Time 1	Professor Religious Commitment at Time 2
Student Religious Commitment at Time 1	.037 (.879)	.142 (.562)
Student Religious Commitment at Time 2	.407 (.084)	.492* (.033)
Difference between Student Religious Commitment (T2-T1)	.585** (.008)	.588** (.008)

n = 19, *significant if $p < .05$ **significant if $p < .01$

	Professor Traditional Religiosity Grand Average	Professor Traditional Religiosity T2-T1	Professor Religious Commitment Grand Average	Professor Religious Commitment T2-T1
Student Traditional Religiosity Grand Average	.213 (.380)	.184 (.450)	-.029 (.906)	.257 (.287)
Student Traditional Religiosity T2-T1	.061 (.804)	.183 (.454)	-.061 (.804)	.121 (.621)
Student Religious Commitment Grand Average	.477* (.039)	.396 (.094)	.323 (.177)	.331 (.166)
Student Religious Commitment T2-T1	.519* (.023)	.378 (.111)	.604** (.006)	.275 (.255)

n = 19, *significant if $p < .05$ **significant if $p < .01$

Although not as blatant as the value assimilation findings for religious commitment, findings suggest that students were influenced by their professors' values in three other domains: social stimulation, withdrawal from people, and thriftiness. A negative, significant relationship was found between professors' and students' change in social stimulation over time ($r_z = -.504, p = .028$). This suggests that as professors decrease in the value they place on social stimulation, students respond by increasing their valuation of social stimulation. In a slightly different fashion, a negative significant relationship was also found between professors' change in withdrawal from people and students' average level of withdrawal from people ($r_z = -.500, p = .029$). Again, this suggests that if students highly endorse withdrawal from people, professors decrease their

valuation of withdrawal from people. Finally, a positive, significant relationship was found between professors' and students' level of thriftiness ($r_z = .499, p = .030$).

Professors who became more thrifty over time had students who had higher thriftiness levels overall. These findings are presented in Table 27.

Table 27. Other correlation tables for professors' and students' values suggesting value assimilation (p value in parentheses).

Social Stimulation		
	Professor Social Stimulation Grand Average	Professor Social Stimulation T2-T1
Student Social Stimulation Grand Average	-.022 (.928)	.077 (.754)
Student Social Stimulation T2-T1	-.333 (.163)	-.504* (.028)

n = 19, *significant if $p < .05$ **significant if $p < .01$

Withdrawal from People		
	Professor Withdrawal from People Grand Average	Professor Withdrawal from People T2-T1
Student Withdrawal from People Grand Average	-.177 (.468)	-.500* (.029)
Student Withdrawal from People T2-T1	.423 (.071)	.021 (.932)

n = 19, *significant if $p < .05$ **significant if $p < .01$

Thriftiness		
	Professor Thriftiness Grand Average	Professor Thriftiness T2-T1
Student Thriftiness Grand Average	.282 (.242)	.499* (.030)
Student Thriftiness T2-T1	-.029 (.905)	-.271 (.261)

n = 19, *significant if $p < .05$ **significant if $p < .01$

Qualitative analyses. During both times of data collection, students answered two questions, 1) “How has this course impacted/changed your perspective towards yourself, others, the world, etc.?” and 2) “What other areas of your life have impacted/changed your perspective towards yourself, others, the world, etc.?” Latent Dirichlet Allocation (LDA) is a three-level hierarchical Bayesian model (Blei, Ng, and Jordan, 2003). LDA models each item in a collection of documents as a finite mixture over an underlying set of topics so that, in the context of text modeling, the topic probabilities provide an explicit representation of a document. Usually when using LDA, a number of topics are stated to understand the probability for each word in the set of documents. For example, if you had a set of documents about animals, one word, such as “cat,” could have a higher probability of occurring in Topic 1, “domestic animals,” but a lower probability of occurring in Topic 2, “outdoor animals.” Since students were all responding to the same question and only wrote a few sentences, only one topic was used in each model. The value calculated, then, represents the probability for that word to occur in the set of documents. A word with a higher value indicates greater probability for that word to appear in that set of documents due to students’ frequently using it in their responses. For each courses, LDA was used to examine students’ responses at Time 1 and at Time 2 for Question 1 and Question 2.

LDA was used to examine the change in words for the responses to Question 1: Course Impact from Time 1 to Time 2 and identify if differences existed between values based and non-values based classes. At Time 1 for both values based and non-values based classes, words such as “hasn’t,” “haven’t,” “don’t,” “begun,” and “impacted” were common indicating that at the start of the semester the course had not yet impacted

students' perspective. For Time 2, the responses for the values-based classes commonly used words such as “changed,” “view,” “strengths,” “beliefs,” “realize,” and “aware,” which suggests that students were possibly experiencing a change in their views and beliefs as they became more aware of the world and their personal strengths. The responses from non-values based classes at Time 2 also suggested change, using words such as “realize,” “feel,” and “impacted,” but these were directed towards the course material as indicated through the common use of “world,” “earth,” and “statistics.” The results are summarized in Table 28.

Table 28. Unique words produced using Latent Dirichlet Allocation for different class types for Time 1 and Time 2.

	Time 1	Time 2
Values Based	course: .061817102137767165 response: .039845605700712494 class: .022030878859857498 help: .021437054631828985 perspective: .020249406175771922 hope: .019061757719714967 impact: .017874109263658004 positive: .015498812351543972 life: .014904988123515464 world: .013717339667458427 im: .01312351543942994 hasnt: .011342042755344423 learn: .0107482185273159 understanding: .0095605700712589 understand: .0095605700712589 havent: .0095605700712589 impacted: .0095605700712589 dont: .00896674584323042 -: .00896674584323042 time: .008372921615201893	course: .045279307631786 life: .030723839496459505 helped: .02364280094413847 learned: .015774980330448482 world: .014594807238394993 class: .014594807238394993 perspective: .012234461054287944 positive: .012234461054287944 changed: .011841070023603446 feel: .011841070023603446 strengths: .011054287962234477 realize: .011054287962234477 aware: .00987411487018097 taught: .009480723839496472 response: .009087332808811941 look: .009087332808811941 beliefs: .008300550747442959 view: .008300550747442959 understanding: .008300550747442959 lot: .0071203776553894526

Table 28 (cont). Unique words produced using Latent Dirichlet Allocation for different class types for Time 1 and Time 2.

Non-values Based		
	response: .07991769547325123	course: .03860182370820675
	course: .06427983539094656	response: .03252279635258359
	class: .034650205761316916	class: .02137791286727459
	hasnt: .03135802469135798	world: .020364741641337336
	world: .027242798353909428	changed: .016312056737588676
	impact: .019835390946502093	understanding: .014285714285714256
	time: .012427983539094651	earth: .014285714285714256
	learn: .012427983539094651	time: .0132725430597771
	change: .012427983539094651	learned: .0132725430597771
	havent: .012427983539094651	perspective: .01124620060790273
	help: .010781893004115244	lot: .010233029381965568
	perspective: .009958847736625498	–: .010233029381965568
	im: .009958847736625498	realize: .009219858156028354
	changed: .009958847736625498	statistics: .009219858156028354
	–: .009958847736625498	feel: .009219858156028354
	life: .009958847736625498	impact: .009219858156028354
	impacted: .008312757201646072	look: .008206686930091188
	understanding: .007489711934156374	learning: .008206686930091188
	understand: .007489711934156374	helped: .008206686930091188
	begun: .007489711934156374	understand: .007193515704154013

*unique words are marked in red

Further text analytics investigated change in responses over time for each individual class. Question responses were analyzed using “TextRank,” a text analytics algorithm widely applied for automated text summarization but most famously used in page ranking, which was the foundation for Google Incorporated (Page, Brin, Motwani, & Winograd, 1998). Text ranking is a link analysis algorithm that assigns a numerical weighting to each element in a document with the purpose of measuring its relative importance within the set. A TextRank analysis on a document returns the most popular words and phrases in that document. Table 29 summarizes the most commonly used words and phrases for each course from Time 1 to Time 2. It is evident that at the end of the semester the values-based classes influenced students’ responses to reflect on their values and beliefs versus the non-values based classes where students reflected more on the information that they have learned during the semester. For example, as shown in

Table 30, at the start of the semester, students in both class types used the same words such as “course,” “learn,” “help,” and “hasn’t.” This indicated that students were hopeful that the course would impact them but it had not yet done so. At the end of the semester, values-based classes used words about their perspective and awareness, e.g., “changed perspective,” “view/worldview,” “learn,” “aware,” and “strengthen.” The non-values based classes used words that were class specific, such as “statistics,” “skills,” “data,” “earth,” and “learned.”

Table 29. Change in students' responses to course impact question (Question #1) from Time 1 to Time 2, categorized by professor and class type (frequency of word in parentheses).

Values Based Classes				
Professor	Time 1		Time 2	
B.Smith	positive (33) course (30) hope (24)	life (16) impact (15) perspective (15)	life (53) help (40) positive (31)	course (30) strength (30) learn (21)
Cargas	impact (4) world (4)	perspective (3) course (2) course impact (2)	human (7) rights (7) world (7)	human rights (6) bad (4) feel (4)
Chavez-Charles	response (20) course (16) perspective (8)	history (5) hope (5) understand (5)	course (5) look (3) eye (2)	government (2) impact (2) information (2) question (2)
Cohen	impact (4) class (2) beginning (1)	class lectures (1) class lectures impact (1) don't (1)	help (4) class (3) decision (2)	didn't (2) feel (2) future (2)
Delaney	course (10) impact (4) response (4)	beliefs (3) hope (3) life (3)	course (7) beliefs/believe (6) view/worldview (4)	argument (3) changed (3) strengthen (3)
Karmiol	response (14) course (5) struggle (4)	impact (4) struggle response (2) understand (2)	course (15) immigrant (13) world (8)	perspective (7) understand (7) change (7)
Pribis	course (15) help (14) learn (11)	educate (9) impact (8) learn (8)	learn (13) course (12) counsel (10)	help (10) health (7) feel (6)
Ruthruff	course (27) response (23) understand (15) class (14)	haven't (11) help (11) chang* (10)	course (35) help (19) understand (18)	learn (14) aware (13) life (13) belief (12)
Swanson	course (7) helped (3) begun (2) class (2)	course impact (2) feel (2) hasn't (2)	course (7) helped (3) look (3)	perspective (3) caused (2) change (2) change perspective (2)
Non-values Based Classes				
Bridges	response (36) course (5) impact (4)	change (3) begun (2) change perspective (2)	course (3) impact (3) time (3) appreciate (2)	hasn't (2) learned (2) response hasn't (2)
Erhardt	response (37) course (15) class (12)	hasn't (9) impact (8) statistic (8)	course (7) data (6) response (6) skill (6)	understand (6) world (5) feel (4)
G.Smith	course (17) class (9) hasn't (9)	change (8) world (8) appreciate (6)	course (15) learn (11) change (10) class (8)	look (6) realize (6) understand (6) world (6)
McFadden	course (30) response (28) hasn't (17)	class (16) impact (15) learn (13)	course (10) response (9) change (8)	earth (8) world (7) environment (5)
Sonksen	response (44) course (7) life (6)	class (4) help (4) skills (3)	response (4) statistics (4) course (3) lot (3)	understand (3) greater (2) learned (2)

Table 30. Change in students' responses to life impact question (Question #2) from Time 1 to Time 2, categorized by professor and class type (frequency of word is in parentheses).

Values Based Classes				
Professor	Time 1		Time 2	
B.Smith	life (23) family (19) change (17)	help (14) relationship (13) response (12)	change (20) help (20) relationship (20)	world (13) impact (12) love (12)
Cargas	experiences (5) life (5) world (5)	view (4) impact (3) beliefs (2)	perspective (4) class (3) impact (3)	family (2) friends (2) helped (2)
Chavez-Charles	response (9) change (8) impact (6) perspective (6)	world (6) life (5) parents (4)	life (2) town (2) changed perspective (1) friends (1)	intense (1) personal (1) self (1)
Cohen	life (3) age (2) change (2)	experiences (2) nutrition (2) response (2)	influence (2) world (2) change world (1)	nutrition (1) child (1) child story (1)
Delaney	help (5) impact (4) interact (4)	life (4) perspective (4) response (4)	life (5) perspective (5) change (3)	class (3) course (3) God (3)
Karmioli	response (14) friends (2) impact (2)	academic (1) books (1) experiences (1)	learn (7) world (7) change (5)	friends (5) life (5) help (4)
Pribis	life (11) family (9) response (9)	impact (7) love (7) world (6)	family (7) friend (7) relationship (5)	community (4) makes (4) perspective (4)
Ruthruff	life (3) response (22) chang* (17)	family (16) impact (15) perspective (14) world (14)	change (19) relationship (18) family (16)	impact (15) change perspective (11) responsibility (11)
Swanson	impact (6) world (5) perspective (4)	experiences (3) family (3) life (3)	perspective (4) changed (3) relationships (3)	changed perspective (2) environment (2) family (2)
Non-values Based Classes				
Bridges	response (35) impact (5) life (5)	relationship (4) family (3) perspective (3)	response (6) perspective (5) family (4)	impact (4))moving (4) impact perspective (3)
Erhardt	response (9) change (8) experiences (7)	life (7) personal (7) travel (7) friends (6)	family (6) response (6) world (6)	course (5) friend (5) school (5)
G.Smith	change (7) impact (7) help (6)	life (6) family (5) learn (5)	response (8) family (7) life (7)	school (7) experience (4) impact (4)
McFadden	life (25) perspective (25) change (21)	impact (18) relationship (16) friends (14) world (14)	response (17) family (8) change (7)	class (7) life (6) impact (4)
Sonksen	response (6) family (5) changed (4)	travel (4) friend family (3) actual (2)	response (12) sonksen (3) experiences (2)	I've (2) life (2) personal (2)

Chapter 4

Discussion

My purpose in this study was to join the many social scientists who have realized the importance of researching beliefs, values, and attitudes (BVAs) due to the insight that they provide into cognitive processes, decisions, and behaviors. Focus was also directed to how the dynamics of one's surrounding context could influence BVAs to change over time. This study focused on how students' values are affected by the university setting, specifically the classroom environment. It might generally be expected that college students' academic journey will foster value anchoring and value change but the findings from this study shed light on what factors are contributing to that change.

Implications of this study's findings are discussed. This research study examined how BVAs are influenced to change over time in the academic setting through three main hypotheses:

- 1) Students would demonstrate BVA change over time while professors' BVAs would remain relatively stable over time.
- 2) Students' attributes would influence BVA change, specifically through age, year in school, initial commitment to values, religious status, and religious commitment. It was expected that those who were: under 21, had less college experience, reported a weak adherence to values at the start of the semester, were not religious, or had little to no religious commitment would report higher levels of BVA change compared to their counterparts.
- 3) Students, especially those who had a positive experience in the class, would assimilate to their professors' BVAs.

Overall, it was found that in the academic setting BVAs do change over time, for students as well as for professors, that students demonstrate greater BVA change over

time, and that students' attributes influence how much their BVAs change. It was also found that students assimilate to professors' positions but only for specific BVAs. The nature of the value under examination was significant to the type of value change occurring. Values such as Personal Growth & Inner Harmony and Getting Ahead were found to consistently be highly valued at the start of the semester as well as at the end and did not appear to be impacted by class type, course material, or the professor. Other values such as Traditional Religiosity and Religious Commitment were found to both change in different directions across the semester as well as be influenced by the classroom environment and professor. These findings are discussed in more detail by their respective hypothesis in the following sections below.

Findings for Hypothesis 1: Students' and Professors' BVA change over time

It was expected that values would not change for professors but would change for students. This hypothesis was partially supported. Students' showed significant change in their values over time, as expected. Contrary to predictions, professors were also found to significantly change in their values over time. Students were still found to have higher degrees of change more frequently than professors, indicating that students demonstrate greater levels of value change.

The 1971 Flinders study (see page 54; Feather, 1975) found that after two and a half years in college, students' values showed considerable change. More specifically, students showed greater values for: a world of beauty, mature love, intellect, and forgiveness, while other values, such as: a sense of accomplishment, national security, salvation, ambition, obedience, politeness, and self-control, were ranked lower. The current study utilized the 1 to 18 ranking process found in the Rokeach Value Survey,

which the Flinders study used, as well as mean averages for individual values, as measured by the GSVI and MVI. This study confirmed the 1971 Flinders findings but, in addition, showed that not only are values overall are changing over time, demonstrating the malleability of students' values, but values are changing over a much shorter time period, just one semester (16 weeks).

Having professors show significant value change over the semester was both unexpected as well as concerning. As discussed in the introduction, positions of authority and steadfast values influence dynamics such as value anchoring and assimilation. Those with less stable values tend to be guided by those with stronger values. The hope for the classroom setting is that it is a place where students can openly consider and anchor their own BVAs in relation to their worldview by hearing the opinions of their professors and colleagues (Emmanuel & Delaney, 2014). It is more difficult for students to consider their own BVAs in relation to their professors when their professors' values are not consistent over time.

The different courses looked at in this study were also expected to have an impact on value change. Individual courses were found to influence change in values demonstrated on a daily basis such as honesty, positive orientation towards others, carefreeness, as measured by the MVI overall. Students' level of Assertiveness was especially found to change over time. For both the MVI overall and Assertiveness, it was found that the Honors classes in this study were the source of change. However, neither the department nor the class type was found to influence the direction or magnitude of change. These findings suggested that the change in specific values, such as with the analyses for MVI overall and Assertiveness, was specific to individual classroom

environments. One unexpected finding was that the professors' level of Traditional Religiosity related to change in MVI overall. Students with professors who reported lower levels of Traditional Religiosity decreased in MVI overall over the semester whereas students who had professors with higher levels showed an increase over time. Therefore, it was concluded that while department and class type could be important to shaping values at an institutional level, the course material, the professors' emphasis on specific values, or both were found to have stronger, more direct impact on students.

Findings for Hypothesis 2: Students' attributes will influence BVA change.

It was expected that students who were younger (under 21), had less college experience, reported a weak adherence to values at the start of the semester, were non-religious, or had little religious commitment would report higher levels of BVA change compared to their counterparts. This study found that various students' attributes contributed differently to value change, some being more influential than others. Age, year in school, and gender are demographics that describe attributes of a student and what life stage he or she is in. None of these attributes were found to be strong predictors of value change. On the other hand, student attributes reflecting where they were in conviction and commitment to values were found to predict value change. Initial commitment to values, reported religious status, and religious commitment were all robust predictors of change. All of them supported the hypotheses that the weaker a student was in one or more of these areas of value commitment, the more susceptible he or she was to value change. In all cases, higher levels of value change were found for those reporting lower levels of initial BVA commitment, non-religious status, and lower levels of religious commitment.

As with Hypothesis 1, the university setting, specifically the classroom context, exposes students to new worldviews, perspectives, and philosophies. These exposures provide an opportunity for students to consider their current value system and perhaps refine their values or change them completely based on new information. Conversely, students who have strong, grounded, and established BVAs, regardless of where they are in their life journey, are less likely to change their BVAs based on new information. In fact, students with strong convictions may see opposing worldviews as an opportunity to strengthen their own BVAs as they contemplate the gaps and weaknesses in other worldviews and learn how to defend their personal position. Figures of authority and course material are predicted to influence students' values to change, as will be further discussed in Hypothesis 3. However, students may have other authority figures and resources, such as religious leaders, philosophers, and theologians, and the beliefs they teach, outside of the academic setting which shape their personal convictions and keep their BVAs steadfast even when faced with opposing or competing information in the classroom context.

Findings for Hypothesis 3: Students Assimilate to Professors' BVAs.

It was expected that students would assimilate to their professor's BVAs and levels of assimilation would vary by class type and students' experience in the class. Replicating the methodology and analyses used in Schwehn and Schau (1990), the Rokeach Value Survey (RVS) was first used to measure value assimilation. The RVS, as a reminder, measures terminal values which are values with a specific goal or aim (e.g., world peace, an exciting life), and instrumental values which are manifested in one's daily life (e.g., honesty, ambition, cheerful).

Overall, students were found to assimilate to their professors' values for terminal values. One interpretation of this is that some classes focus on topics having an inherent goal or aim, such as seeking solutions to threats to human rights (UHON401), investigating suffering, sexuality, and the meaning of life (UHON301), or caring for the blue planet (ENVS201). Through the course material, professors may have encouraged their students to value principles that facilitate achieving a greater goal. The relationship between professors' and students' instrumental values was not found to increase over the semester, but class type was found to have an interesting impact on instrumental values. The relationship between professors' and students' instrumental values was found to increase over time for non-values based classes but decrease for values-based classes. One interpretation is that students in non-values based classes tended to have lower BVAs compared to values-based classes as well as less convergence with the professors' values (see *Figure 9*) at the start of the semester. This provided more room for students in non-values based classes for both their values to change over time and for value assimilation. For values-based classes, findings could again be attributable to students in value-based classes already having higher levels of BVAs that were in alignment with their professors and, in result, had less room to assimilate. Another interpretation could be that values-based classes had room for discussion and consideration of various worldviews. Students had the opportunity to consider and refine their values but did not feel obligated to converge with their professor's perspective. Another argument is that professors' changing values were more apparent through dialogue in the values-based classes, making it more difficult for students to assimilate to their values.

Students' assessment of their professor's ability to teach also impacted value assimilation so that students who had more favorable reactions to their professor assimilated to their professor's values more than those who did not think as highly of their professor. Surprisingly, noticeable differences were only detected among non-values based classes. Those who reported a high belief in their professor's teaching efficacy assimilated to their professor's values, both for terminal and instrumental beliefs, more than those who reported a low belief. In contrast to values-based classes where students may have had more dialogue and freedom to discuss BVAs in the classroom setting and therefore be exposed to their professor's BVAs, students in non-based classes may have had less opportunity to know their professor's worldview. Hence, students who thought favorably of their professor may have had more opportunity to be exposed to their professor's BVAs through side conversations or by paying more attention to what their professor was expressing in class compared to students who did not think highly of their professor.

Value assimilation was also investigated for specific values. Effects were found for students' level of thriftiness, withdrawal from people, and social stimulation. Regarding thriftiness, students who had professors who increased their value of thriftiness also became thriftier. Regarding withdrawal from people and social stimulation, students diverged from their professor's values. As professors valued more withdrawal from people, students decreased their values in withdrawal. Also, as professors decreased their value of social stimulation, students increased their value of social stimulation. While students did not necessarily adopt their professors' BVAs, they were influenced by them and used them as a template to refine their own specific BVAs.

Religiosity continued to stand out as a value impacted by the college context. This was especially true for value assimilation. Overall change in students' religious commitment was predicted by both professor's traditional religiosity and religious commitment. The more professors valued religious experiences and beliefs such as salvation, spiritual experiences, fidelity, and devotion, the more the students are reported valuing these religious attributes. Conversely, if professors did not value these religious attributes, students also decreased their value of religiosity. Ultimately, professors' religious beliefs, values, and attitudes have a strong impact on their students' religious BVAs. Less religious professors encourage their students to be less religious, and more religious professors encourage their students to value religiosity more.

Ultimately, these findings demonstrate that the classroom context, comprised of the course material and the professor's presence, is more indicative of value change and assimilation than class type or department. Students' BVAs are impacted by their professors' beliefs and the course material that they are learning in both positive and negative ways. These findings also may indicate that there are contributing factors to value change outside of the classroom context and academic setting. Students are learning new information in the classroom but they are also having novel exposures in various settings such as their home life, social interactions, extracurricular activities, and work experiences which might impact their BVAs.

Qualitative Analyses of Text Written by Students.

Self-report measures are helpful in quantifying latent variables such as beliefs, values, and attitudes, but they are also limited in their ability to fully measure latent constructs. A mixed method approach that incorporates both quantitative and qualitative

data is helpful to understand the whole picture. Text analytic methods were conducted on students' written responses for how the course they were in impacted them. Analyses showed that most students at the start of the semester entered the class with an expectation to learn the course material but did not feel that the course had yet impacted them. By the end of the semester, students described the impact the course had on them, but the nature of this impact differed between students in values-based and non-values based classes. Findings were similar to the study done by Feldman and Newcomb (1969), which found that students in mathematics or natural sciences reported positive attitudes toward their own sense of intellect and interpersonal self-esteem and students in social sciences had positive attitudes towards interpersonal self-esteem, artistic interests, and liberalism. Students in non-values based classes were impacted by the information presented by the course material. If they were in an Earth and Planetary Sciences classes, they talked about the earth, world, and environment. If they were in a Statistics or Math class, students talked about data. Or, such as with the Computer Science classes, they did not feel impacted by the course. Overall, students in non-values based classes reflected on the information they had acquired. However, in the values-based classes, students reported more about their changing worldview and perspective, their beliefs about the government, human rights, and/or God. Students' responses were still based on the content that they learned in their specific course, but their responses were beyond information acquired in the class; students shared how their greater view of the world and personal BVAs had been impacted.

Implications of Study Findings

As past research literature (e.g., Pascarella & Feldman, 2005; Astin, 1993; Vreeland & Bidwell, 1966) as well as the findings of this current study suggest, there is evidence that students acquire the BVAs of their academic institution, course content, and professors. To better understand the nature of BVAs in the academic setting as well as how and why university students may alter their personal BVAs, it is important to understand how value change and assimilation occurs over the academic journey.

Methodology and metrics from other relevant, empirical literature, such as in clinical psychology (Schwehn & Schau, 1990; Strupp, 1980), and the quantification of BVAs through the Rokeach Value Survey, Goal, Social, and Mode Values Inventories enable researchers to track the change in BVAs over time and examine the relationship between professor and students' BVAs. As found in this study, specific classroom environments, reflecting both the professor and the course material, influence students to change, refine, and/or anchor their beliefs, values, and attitudes. This study especially found value change and assimilation to occur for values surrounding religiosity and faith-based beliefs, even in a sample of students attending a secular, public university.

Strengths and Weaknesses

The current study had a large sample size, a diverse range of courses, departments, and professors, and validated, reliable measures to quantify values. Professors were willing to permit researchers to come into their classroom two different times which meant that BVAs were measured directly in the academic context. The contrast between non-values and values-based classes also allowed researchers to target some of the potential sources of change. Although the findings from this study point to

value change and value assimilation, there were weaknesses that also need to be considered.

Attrition. There were about 600 students who completed the questionnaire at the start of the semester and another 600 who completed it at the end of the semester. However, there was a fairly high number of students who withdrew which allowed for a new group of students to enroll in the courses after the first week. At the start of the semester, there were 674 students who completed the questionnaire, and at the end of the semester, there were 550 students; only 414 students had data for both times, which was 62% of the data collected at Time 1 and 75% of the data collected at Time 2. A high percentage (approximately 47%) of students also enrolled in the course but did not show up to class the last week of classes when the second round of data collection took place. It could be argued that students who continue to faithfully attend class have higher levels of motivation and have other values that differ from students who skip class. These differences would not have been accounted for in the current study's findings.

Classification of Courses. Classes were classified into values-based and non-values based classes based on the intent of the academic department. Classes in Psychology, Education, and the Honors College were put in the values category whereas classes in Earth & Planetary Science, Math & Statistics, Computer Science, and Environmental Science were classified as non-values based. The non-values based departments focused on information, facts, and knowledge, but after looking at the specific course content, some of the classes did incorporate values. For example, Environmental Science 101 emphasized the beauty of the earth, policy around climate change, and how to care for the planet. Because this research emphasizes that no

institution is truly value-free, the division of courses into class type may best be done by looking at the intent and vision of each individual class rather than by department. For example, a psychology class may focus on social research in diversity which would be classified as value-based whereas another psychology class may teach experimental design and focus on facts and information and be classified as non-values based. Similarly, a professor may have very strong beliefs about politics, for example, and incorporate that into all the courses they teach, whether it be statistics, accounting, or other courses where values are not expected to be discussed.

Generalizability. Hypotheses in this study were generally supported but data was only collected from a single, public university. Value change and assimilation may vary across different types of colleges and universities. Similar to the clinician-therapist context, value assimilation is the strongest when there is a face-to-face, one-on-one relationship; personal topics are discussed; there is an authority figure; and the relationship continues over a period of time. Academic institutions with smaller classes, more frequent professor-student interactions, and/or classes with discussion-based formats may demonstrate more value assimilation than those with larger and lecture-based classes.

The Role of Ethics in the Classroom

The more one learns about the potential for professors and the classroom environments they nurture to foster students' value change as well as assimilation, the clearer the ethical concerns become, especially when the change is unsolicited and subconscious. However, there are different perspectives on how the influence on values should be handled. Regarding religious and spiritual values, *What shall we tell the*

children? is a polemic written by psychologist Nicholas Humphrey on how religions abuse the minds of children (Humphrey, 2003). Famous atheist, Richard Dawkins, cites Humphrey's work as a call to "work to free the children of the world from the religions which, with parental approval, damage minds too young to understand what is happening to them" (Dawkins, 2006). Freeing adolescents from the influence of religious-based environments so that they can make their own biased-free decisions includes banishing faith-based institutions and insisting that adolescents and young adults attend *value-free*, secular colleges and universities. Nevertheless, as found in this current study, beliefs, values, and attitudes, especially those regarding religiosity and spirituality, are impacted by the people and content students are surrounded by, not by the label or categorization of their school. Students leave the faith they were reared in or acquire religious beliefs at both secular and faith-based institutions. This proposition is supported by research that has shown that rates for both apostasy and religious commitment do not differ much between faith-based and secular institutions (Smith & Sikkink, 2003). Students are influenced not by the over-arching category of the school but by the individual academic, social, and philosophical experiences they have with their professors and in the classroom.

Therefore, if the call from the research, philosophy, and general community is to encourage individuals to formulate their values through independent, personal decisions, instead of moving students from one value institution (e.g., faith-based) to another value-based institution (secular and/or agnostic), perhaps a better method would be transparency and consent to allow individuals to best make their decisions. An environment of transparency and consent would prevent subconscious value assimilation

and encourage an academic setting where values were respected, students directly were accountable for considering their personal beliefs, and values, and attitudes were openly discussed and considered (see Smith, Vicuña, & Emmanuel, 2015).

One domain that provides guidance for how to accomplish an open, honest environment is clinical psychology. As psychologist Tjeltveit (1986) stated, therapists engage in four types of ethically problematic behaviors when value conversion occurs: reducing client freedom, failing to inform clients of the possibility of value conversion, violating the therapeutic contract, and operating beyond the limits of their competence. Although completely eliminating one's personal values from therapy is impossible, Tjeltveit proposed five solutions to alleviate subconscious value conversion: therapist training, therapist-client matching, referrals, changing roles, and informed consent. As therapists and rising clinicians become more aware of their biases, they can better learn what role their values play in therapy. This will enable therapists to be honest in the therapeutic relationship and thus protect client autonomy and enhance the overall therapeutic relationship. Clinical psychology's emphasis on informed consent helps to guide the therapeutic relationship, specifically through American Psychology Association Code of Ethics, Standard 10.01 "Informed Consent to Therapy." Standard 10.01 requires clinical psychologists to "inform clients/patients as early as is feasible in the therapeutic relationship about the nature and anticipated course of therapy..." Although informed consent is a debatable topic among psychologists, Tjeltveit (1986) proposes different degrees of informed consent to notify clients of potential value conversion in order to enhance the therapist-client relationship as well as provide balanced reassurance with a realistic portrayal of risks. Adequate levels of informed consent allow therapy clients to

be aware of value assimilation risk without providing so much information that clients are alarmed and decline treatment. Clinical psychology literature suggests that a standard written consent form which highlights risks and potential outcomes should be provided to the client. Tjeltveit offers a continuum of disclosure levels which should be chosen based on the nature of therapy. The level of disclosure can be as simple as, “Clients are likely to change in therapy,” or as extensive as the following:

“Clients are likely to change in therapy; this may include changes in...their values. While therapists strive to be objective regarding values and clients are always free to hold and adopt values of their choice, in some instances, clients’ values change in the direction of therapist values. Therefore, it may be important for you to know some of my values. My moral values are [for instance] liberal, my religious conviction is agnostic, and my political values are liberal Democratic. Again, you are entirely free to hold whatever values you wish.” (p. 529)

The level of informed consent allows for clients to ask direct questions about therapist values, to be reassured that they have the right to agree or disagree, and understand that they are not in a value-free, neutral context.

The same concerns in the clinical environment exist in the academic environment. Students have a professor as their authority and may feel obligated to agree with their professor which reduces their freedom. Professors most often do not inform students of the possibility of value assimilation and may not even be aware of how their level of authority subconsciously draws students’ BVAs to their own. Students attend public universities for the opportunity to hear from their professors and colleagues about various worldviews and opinions and be free agents who decide what is wrong and right. The

student-professor contract is at risk of being violated if students are told what to believe or are denied exposure to multiple perspectives (e.g., evolution, intelligent design, creationism). Professors also run the risk of operating beyond the limits of their competence if they tell students what to believe or they present material that is beyond the course topic.

Since both the clinical and academic settings are contexts where a power differential is present and the individuals of lesser power have BVAs that are malleable and vulnerable, lessons can be learned from the clinical literature and applied to the education setting. It seems unrealistic to ask students to sign informed consent forms when they start taking a course from a professor. It is essential, however, for professors and professionals in academia to inform their students that the classroom context is not value-free, but rather a setting where students have an opportunity to consider their values. With this in mind, it is critical for professors to be aware of their own values and be as transparent as necessary about those values with their students while encouraging an open dialogue environment. Value change and assimilation may still occur but, instead of having subconscious, or even unwanted change, students would be more aware, proactive, conscious, and in control of the change.

Future Research

The findings from this study were intriguing, especially for the impact on religious values. There were also unexpected and inconsistent results. Additional research is needed to better understand how value change occurs as well as what individual values are most vulnerable in the academic setting. Ideas for additional research topics are briefly considered.

In order to investigate value change, this study examined a wide spectrum of values. Terminal and instrumental values are broad categories, and the GSVI and MVI quantify an extensive set of values. In order to better understand what types of values are most vulnerable to influence and why, future research could target a specific set of values that should be nurtured by the academic setting in an open, transparent manner. For example, religious beliefs, political views, social issues such as views on abortion and gay marriage are examples of value types that should not be forcefully manipulated by the professor and course material but rather considered by students through honest dialogue where multiple perspectives are discussed. These values could be researched in the academic setting to investigate the dynamics of value change and assimilation.

Research in this area would also benefit from data collected from different types of universities. It would be interesting to understand the differences between small colleges and large universities, private and public institutions, faith-based versus secular, small and large classroom sizes, and online versus in-person classroom formats.

This study collected data from both undergraduate and graduate students but the graduate student sample was very small. Additional studies in this area should understand how graduate students' values are influenced and what contributes to value change. It would be very interesting to investigate the relationship between graduate students' and their advisors' values over the course of their graduate degree program. Age and year in school were not found to be predictive of value change but initial commitment to values and religious beliefs were predictive factors, so it could be that graduate students, especially if they have a close, positive relationship with their advisor, become more aligned to their professors' BVAs over time.

Also, this study looked at how students were impacted by class type and their professors but it ignored the possibility of students influencing students. Future research could better understand if, how, and why students influence other students' values to change.

Finally, and most important, assuming that value assimilation occurs in the classroom, it is crucial for additional research to explore when value assimilation is a positive effect that enables and benefits both students and professors, as well as when it is a negative effect that violates students' freedom and the intent of the student-professor relationship.

Summary & Conclusion

In conclusion, the design, analyses, and findings of this study leveraged empirical literature from various domains to quantitatively research how BVAs change and assimilate to figures of authority. More specifically, the study considered how the presence of a power differential within various settings, such as academia, influence individuals to alter their beliefs, values, and attitudes to align with someone considered to be superior and how value assimilation can have both positive and negative consequences. University students constitute one such population that is susceptible to BVA change due to the authority and role of their professors.

The findings from this study indicate that value change does occur over a semester timeframe for both students and professors. Students attending university are in an environment that allows for them to consider their personal BVAs and refine, alter, or change them completely based on information they learn in their classes. However, students may be unaware of how their beliefs, values, and attitudes are being affected by

the course material they are learning and the worldviews their professor brings to the class. Students may subconsciously align their worldview to their professor and professors, through their level of authority, may subconsciously encourage it. To ensure that the academic setting does not provoke a decrease in values or subconscious, unethical value conversion, professors and academia professionals should be transparent and not force their values into course material and onto their students. In the same way, the classroom setting can be used by professors to nurture growth and maturity of thought, by being respectful and considerate of various worldviews and promoting discussion of students' values in class.

Appendices

Appendix A. Professor Questionnaire

BVA Questionnaire

Thank you for participating in this study on Values in the Classroom. This packet of measures will take approximately 20 – 30 minutes to complete. Please be open and honest with your responses. Your responses will only be viewed by the researchers on this study and will *not* be shared with your institution.

Your participation is completely voluntary. You may withdraw from this study at any time by not completing this packet or turning in your packet to the researcher. We ask that you read each item carefully but you may skip any item you feel uncomfortable answering. Your performance in this class is not linked in any way to your responses on this questionnaire.

If you have any questions while completing this packet, please ask the researcher present.

Thank you again for taking the time to complete this questionnaire. Your participation is greatly appreciated.

Course Code: _____

Department: _____

Demographics:

Gender (circle one): Female Male Other

Age (write in): _____ years

Race/Ethnicity (write in): _____

Years teaching (write in): _____ years

Topic you're teaching (write in): _____

Political Preference (circle one #): 1 2 3 4 5
Very Conservative Very Liberal

Religious Preference (write in): _____

Rokeach Value Survey

Rokeach, M. (1973). *The Nature of Human Values*. New York: The Free Press.

On this page there are two lists of values, each in alphabetical order. Each value is accompanied by a short description and a blank space. Your goal is to rank each value in its order of importance to you for each of the two lists. Study each list and think of how much each value may act as a guiding principle in your life. Rank ALL values from 1 (most important) to 18 (least important) Then go to the next column and rank the next 18 values in the same way. **Please do each column separately.**

When ranking, take your time and think carefully. Feel free to go back and change your order should you have second thoughts about any of your answers. When you have completed the ranking of both sets of values, the result should represent an accurate picture of how you really feel about what's important in your life.

Terminal Values (Rank from 1 – 18)		Instrumental Values (Rank from 1 – 18)	
A.	A Comfortable Life: a prosperous life	A.	Ambitious: hardworking and aspiring
B.	Equality: brotherhood and equal opportunity for all	B.	Broad-minded: open-minded
C.	An Exciting Life: a stimulating, active life	C.	Capable: competent; effective
D.	Family Security: taking care of loved ones	D.	Cheerful: lighthearted, joyful
E.	Freedom: independence and free choice	E.	Clean: neat and tidy
F.	Health: physical and mental well-being	F.	Courageous: standing up for your beliefs
G.	Inner Harmony: freedom from inner conflict	G.	Forgiving: willing to pardon others
H.	Mature Love: sexual and spiritual intimacy	H.	Helpful: working for the welfare of others
I.	National Security: protection from attack	I.	Honest: sincere and truthful
J.	Pleasure: an enjoyable, leisurely life	J.	Imaginative: daring and creative
K.	Salvation: saved, eternal life	K.	Independent: self-reliant; self-sufficient
L.	Self-Respect: self-esteem	L.	Intellectual: intelligent and reflective
M.	A Sense of Accomplishment: a lasting contribution	M.	Logical: consistent; rational
N.	Social Recognition: respect and admiration	N.	Loving: affectionate and tender
O.	True Friendship: close companionship	O.	Loyal: faithful to friends or the group
P.	Wisdom: a mature understanding of life	P.	Obedient: dutiful; respectful
Q.	A World at Peace: a world free of war and conflict	Q.	Polite: courteous and well-mannered
R.	A World of Beauty: beauty of nature and the arts	R.	Responsible: dependable and reliable

Goal and Social Values Inventories (Braithwaite & Law, 1985)

Respond to each item by circling if it is important or not important to you.

- 1 – Not at all important to me
 2 – Not important to me
 3 – Neither important or not important to me
 4 – Important to me
 5 – Very important to me

	Not at all important to me			Very important to me	
International Harmony and Equality					
1. A good life for others: improving the welfare of all people in need	1	2	3	4	5
2. Rule by the people: involvement by all citizens in making decisions that affect their community	1	2	3	4	5
3. International cooperation: having all nations working together to help each other	1	2	3	4	5
4. Social progress and social reform: readiness to change our way of life for the better	1	2	3	4	5
5. A world at peace: being free from war and conflict	1	2	3	4	5
6. A world of beauty: having the beauty of nature and of the arts (music, literature, art, etc.)	1	2	3	4	5
7. Human dignity: allowing each individual to be treated as someone of worth	1	2	3	4	5
8. Equal opportunity for all: giving everyone an equal chance in life	1	2	3	4	5
9. Greater economic equality: lessening the gap between the rich and the poor	1	2	3	4	5
10. Preserving the natural environment: preventing the destruction of nature's beauty and resources	1	2	3	4	5
National Strength and Order					
11. National greatness being a united, strong, independent, and powerful nation	1	2	3	4	5
12. National economic development: having greater economic progress and prosperity for the nation	1	2	3	4	5
13. The rule of law: punishing the guilty and protecting the innocent	1	2	3	4	5
14. National security: protection of your nation from enemies	1	2	3	4	5
Traditional Religiosity					
15. Salvation: being saved from your sins and a peace with God	1	2	3	4	5
16. Religious or mystical experience: being at one with God or the universe	1	2	3	4	5
17. Upholding traditional sexual moral standards: opposing sexual permissiveness and pornography	1	2	3	4	5
18. Sexual intimacy: having a satisfying, monogamous sexual relationship	1	2	3	4	5
Personal Growth & Inner Harmony					
19. Self-knowledge or self-insight: being more aware of what sort of person you are	1	2	3	4	5
20. The pursuit of knowledge: always trying to find out new things about the world we live in	1	2	3	4	5
21. Inner harmony: feeling free of conflict within yourself	1	2	3	4	5
22. Self-improvement: striving to be a better person	1	2	3	4	5
23. Wisdom: having a mature understanding of life	1	2	3	4	5

24. Self-respect: believing in your own worth	1	2	3	4	5
Physical Well-being					
25. Physical development: being physically fit	1	2	3	4	5
26. Good health: physical well-being	1	2	3	4	5
27. Physical exercise: taking part in energetic activity	1	2	3	4	5
Secure and Satisfying Interpersonal Relationships					
28. Mature love: having a relationship of deep and lasting affection	1	2	3	4	5
29. True friendship: having genuine and close friends	1	2	3	4	5
30. Personal support: knowing that there is someone to take care of you	1	2	3	4	5
31. Security for loved ones: taking care of loved ones	1	2	3	4	5
32. Acceptance by others: feeling that you belong	1	2	3	4	5
Social Standing					
33. Recognition by the community: having high standing in the community	1	2	3	4	5
34. Economic prosperity: being financially well-off	1	2	3	4	5
35. Authority: having power to influence others and control decisions	1	2	3	4	5
Social Stimulation					
36. An active social life: mixing with other people	1	2	3	4	5
37. An exciting life: a life full of new experiences or adventures	1	2	3	4	5
Individual Rights					
38. Privacy for yourself: being able to keep your business to yourself	1	2	3	4	5
39. A sense of ownership: knowing the things you need and use belong to you	1	2	3	4	5
40. A leisurely life: being free from pressure and stress	1	2	3	4	5
41. Carefree enjoyment: being free to indulge in the pleasures of life	1	2	3	4	5
42. The protection of human life: taking care to preserve your own life and the life of others	1	2	3	4	5
43. Comfort but not luxury: being satisfied with the simple pleasures of life	1	2	3	4	5

Mode Values Inventories (Braithwaite & Law, 1985)

Respond to each item by circling if it is important or not important to you.

- 1 – Not at all important to me
 2 – Not important to me
 3 – Neither important or not important to me
 4 – Important to me
 5 – Very important to me

	Not at all important to me			Very important to me		
Positive Orientation to Others						
1. Tolerant: accepting others even though they may be different from you	1	2	3	4	5	
2. Helpful: always ready to assist others	1	2	3	4	5	
3. Forgiving: willing to pardon others	1	2	3	4	5	
4. Giving others a fair go: giving others a chance	1	2	3	4	5	
5. Tactful: being able to deal with touchy situations without offending others	1	2	3	4	5	
6. Considerate: being thoughtful of other people's feelings	1	2	3	4	5	
7. Cooperative: being able to work in harmony with others	1	2	3	4	5	
8. Loving: showing genuine affection	1	2	3	4	5	
9. Trusting: having faith in others	1	2	3	4	5	
10. Grateful: being appreciative	1	2	3	4	5	
11. Understanding: able to share another's feelings	1	2	3	4	5	
12. Friendly: being neighborly	1	2	3	4	5	
13. Generous: sharing what you have with others	1	2	3	4	5	
Competence and Effectiveness						
14. Bright: being quick thinking	1	2	3	4	5	
15. Adaptable: adjusting to change easily	1	2	3	4	5	
16. Competent: being capable	1	2	3	4	5	
17. Resourceful: being clever at finding ways to achieve a goal	1	2	3	4	5	
18. Self-disciplined: being self-controlled	1	2	3	4	5	
19. Efficient: always using the best method to get the best results	1	2	3	4	5	
20. Realistic: seeing each situation as it really is	1	2	3	4	5	
21. Knowledgeable: being well informed	1	2	3	4	5	
22. Persevering: not giving up in spite of difficulties	1	2	3	4	5	
23. Progressive: being prepared to accept and support new things	1	2	3	4	5	
24. Conscientious: being hardworking	1	2	3	4	5	
25. Logical: being rational	1	2	3	4	5	
26. Showing foresight: thinking and seeing ahead	1	2	3	4	5	
Propriety in Dress and Manners						
27. Polite: being 'well-mannered'	1	2	3	4	5	
28. Patriotic: being loyal to your country	1	2	3	4	5	
29. Prompt: being on time	1	2	3	4	5	

	Not at all important to me			Very important to me	
30. Refined: never being coarse or vulgar	1	2	3	4	5
31. Clean: not having dirty habits	1	2	3	4	5
32. Neat: being tidy	1	2	3	4	5
33. Reliable: being dependable	1	2	3	4	5
Religious Commitment					
34. Committed: being dedicated to a cause	1	2	3	4	5
35. Devout: following your religious faith conscientiously	1	2	3	4	5
36. Self-sacrificing: putting the interest of others before your own	1	2	3	4	5
37. Idealistic: living according to how things should be rather than how things are	1	2	3	4	5
Assertiveness					
38. Standing up for your beliefs: defending your beliefs no matter who opposes them	1	2	3	4	5
39. Having your say: confidently stating your opinions	1	2	3	4	5
40. Determined: standing by your decisions firmly	1	2	3	4	5
Withdrawal from Others					
41. Keeping to yourself: being content with your own company	1	2	3	4	5
42. Independent: doing things on your own	1	2	3	4	5
Carefreeness					
43. Acting on impulse: doing things on the spur of the moment	1	2	3	4	5
44. Spontaneous: doing what comes naturally	1	2	3	4	5
45. Cautious: not rushing into things	1	2	3	4	5
Honesty					
46. Open: not hiding anything from anyone	1	2	3	4	5
47. Honest: never cheating or lying	1	2	3	4	5
Thriftiness					
48. Thrifty: being careful in spending money	1	2	3	4	5
49. Never missing a chance: taking advantage of every opportunity that comes your way	1	2	3	4	5
Getting Ahead					
50. Ambitious: being eager to do well	1	2	3	4	5
51. Competitive: always trying to do better than others	1	2	3	4	5

Please respond to each item by circling if it is unlike you or like you.

1 = very unlike me | 2 = unlike me | 3 = neither unlike me or like me | 4 = like me | 5 = very like me

	UNLIKE me			LIKE me	
1. I have taken frequent stands in the face of strong opposition.	1	2	3	4	5
2. I never quit a task before it is done.	1	2	3	4	5
3. I always keep my promises.	1	2	3	4	5
4. I always look on the bright side.	1	2	3	4	5
5. I am a spiritual person.	1	2	3	4	5
6. I know how to handle myself in different social situations.	1	2	3	4	5
7. I always finish what I start.	1	2	3	4	5
8. I really enjoy doing small favors for friends.	1	2	3	4	5
9. As a leader, I treat everyone equally well regardless of his or her experience.	1	2	3	4	5
10. Even when candy or cookies are under my nose, I never overeat.	1	2	3	4	5
11. I practice my religion.	1	2	3	4	5
12. I rarely hold a grudge.	1	2	3	4	5
13. I am always busy with something interesting.	1	2	3	4	5
14. No matter what the situation, I am able to fit in.	1	2	3	4	5
15. I go out of my way to cheer up people who appear down.	1	2	3	4	5
16. One of my strengths is helping a group of people work well together even when they have their differences.	1	2	3	4	5
17. I am a highly disciplined person.	1	2	3	4	5
18. I experience deep emotions when I see beautiful things.	1	2	3	4	5
19. Despite challenges, I always remain hopeful about the future.	1	2	3	4	5
20. I must stand up for what I believe even if there are negative results.	1	2	3	4	5
21. I finish things despite obstacles in the way.	1	2	3	4	5
22. Everyone's rights are equally important to me.	1	2	3	4	5
23. I see beauty that other people pass by without noticing.	1	2	3	4	5
24. I never brag about my accomplishments.	1	2	3	4	5
25. I am excited by many different activities.	1	2	3	4	5
26. I am a true life-long learner.	1	2	3	4	5
27. I am always coming up with new ways to do things.	1	2	3	4	5
28. People describe me as "wise beyond my years."	1	2	3	4	5
29. My promises can be trusted.	1	2	3	4	5
30. I give everyone a chance.	1	2	3	4	5
31. To be an effective leader, I treat everyone the same.	1	2	3	4	5

	UNLIKE me			LIKE me	
	1	2	3	4	5
32. I am an extremely grateful person.	1	2	3	4	5
33. I try to add some humor to whatever I do.	1	2	3	4	5
34. I look forward to each new day.	1	2	3	4	5
35. I believe it is best to forgive and forget.	1	2	3	4	5
36. My friends say that I have lots of new and different ideas.	1	2	3	4	5
37. I always stand up for my beliefs.	1	2	3	4	5
38. I am true to my own values.	1	2	3	4	5
39. I always feel the presence of love in my life.	1	2	3	4	5
40. I can always stay on a diet.	1	2	3	4	5
41. I think through the consequences every time before I act.	1	2	3	4	5
42. I am always aware of the natural beauty in the environment.	1	2	3	4	5
43. My faith makes me who I am.	1	2	3	4	5
44. I have lots of energy.	1	2	3	4	5
45. I can find something of interest in any situation.	1	2	3	4	5
46. I read all of the time.	1	2	3	4	5
47. Thinking things through is part of who I am.	1	2	3	4	5
48. I am an original thinker.	1	2	3	4	5
49. I have a mature view on life.	1	2	3	4	5
50. I can express love to someone else.	1	2	3	4	5
51. Without exception, I support my teammates or fellow group members.	1	2	3	4	5
52. I feel thankful for what I have received in life.	1	2	3	4	5
53. I know that I will succeed with the goals I set for myself.	1	2	3	4	5
54. I rarely call attention to myself.	1	2	3	4	5
55. I have a great sense of humor.	1	2	3	4	5
56. I always weigh the pros and cons.	1	2	3	4	5
57. I enjoy being kind to others.	1	2	3	4	5
58. I can accept love from others.	1	2	3	4	5
59. Even if I disagree with them, I always respect the leaders of my group.	1	2	3	4	5
60. I am a very careful person.	1	2	3	4	5
61. I have been told that modesty is one of my most notable characteristics.	1	2	3	4	5
62. I am usually willing to give someone another chance.	1	2	3	4	5
63. I read a huge variety of books.	1	2	3	4	5
64. I try to have good reasons for my important decisions.	1	2	3	4	5
65. I always know what to say to make people feel good.	1	2	3	4	5
66. It is important to me to respect decisions made by my group.	1	2	3	4	5
67. I always make careful choices.	1	2	3	4	5

	UNLIKE me			LIKE me	
68. I feel a profound sense of appreciation every day.	1	2	3	4	5
69. I awaken with a sense of excitement about the day's possibilities.	1	2	3	4	5
70. Others consider me to be a wise person.	1	2	3	4	5
71. I believe that it is worth listening to everyone's opinions.	1	2	3	4	5
72. I am known for my good sense of humor.	1	2	3	4	5

Teacher Self-Efficacy Beliefs Scale (Dellinger, Bobbett, Olivier, Ellett, 2008).

Use the following scale to rate your beliefs about your teaching capabilities:

1. Weak beliefs about my capabilities
2. Moderate beliefs about my capabilities
3. Strong beliefs about my capabilities
4. Very strong beliefs about my capabilities

Right now in this class, I believe the following about my own teaching capabilities to...

	Weak		Strong	
	1	2	3	4
1. plan activities that accommodate the range of individual differences among my students	1	2	3	4
2. plan evaluation procedures that accommodate individual differences among my students	1	2	3	4
3. use allocated time for activities that maximize learning	1	2	3	4
4. effectively manage routines and procedures for learning tasks	1	2	3	4
5. clarify directions for learning routines	1	2	3	4
6. maintain high levels of student engagement in learning tasks	1	2	3	4
7. redirect students who are persistently off task	1	2	3	4
8. maintain a classroom climate of courtesy and respect	1	2	3	4
9. maintain a classroom climate that is fair and impartial	1	2	3	4
10. communicate to students the specific learning outcomes of the lesson	1	2	3	4
11. communicate to students the purpose and/or importance of learning tasks	1	2	3	4
12. implement teaching methods at an appropriate pace to accommodate differences among my students	1	2	3	4
13. utilize teaching aids and learning materials that accommodate individual differences among my students	1	2	3	4
14. provide students with opportunities to learn at more than one cognitive and/or performance level	1	2	3	4
15. communicate to students content knowledge that is accurate and logical	1	2	3	4
16. clarify student misunderstandings or difficulties in learning	1	2	3	4
17. provide students with specific feedback about their learning	1	2	3	4
18. provide students with suggestions for improving learning	1	2	3	4
19. actively involve students in developing concepts	1	2	3	4
20. solicit a variety of questions throughout the lesson that enable higher order thinking	1	2	3	4
21. actively involve students in critical analysis and/or problem solving	1	2	3	4
22. monitor students' involvement during learning tasks	1	2	3	4
23. adjust teaching and learning activities as needed	1	2	3	4
24. manage student discipline/behavior	1	2	3	4
25. involve students in developing higher order thinking skills	1	2	3	4
26. motivate students to perform to their fullest potential	1	2	3	4
27. provide a learning environment that accommodates students with special needs	1	2	3	4
28. improve the academic performance of students, including those with learning disabilities	1	2	3	4
29. provide a positive influence on the academic development of my students	1	2	3	4
30. maintain a classroom environment in which students work cooperatively	1	2	3	4
31. successfully maintain a positive classroom climate	1	2	3	4

Rokeach Value Survey. Rokeach, M. (1973). *The Nature of Human Values*. New York: The Free Press.

On this page there are two lists of values, each in alphabetical order. Each value is accompanied by a short description and a blank space. Your goal is to rank each value in its order of importance to you for each of the two lists. Study each list and think of how much each value may act as a guiding principle in your life. Rank ALL values from 1 (most important) to 18 (least important) Then go to the next column and rank the next 18 values in the same way. **Please do each column separately.**

When ranking, take your time and think carefully. Feel free to go back and change your order should you have second thoughts about any of your answers. When you have completed the ranking of both sets of values, the result should represent an accurate picture of how you really feel about what's important in your life.

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D. Family Security: taking care of loved ones	D. Cheerful: lighthearted, joyful
E. Freedom: independence and free choice	E. Clean: neat and tidy
F. Health: physical and mental well-being	F. Courageous: standing up for your beliefs
G. Inner Harmony: freedom from inner conflict	G. Forgiving: willing to pardon others
H. Mature Love: sexual and spiritual intimacy	H. Helpful: working for the welfare of others
I. National Security: protection from attack	I. Honest: sincere and truthful
J. Pleasure: an enjoyable, leisurely life	J. Imaginative: daring and creative
K. Salvation: saved, eternal life	K. Independent: self-reliant; self-sufficient
L. Self-Respect: self-esteem	L. Intellectual: intelligent and reflective
M. A Sense of Accomplishment: a lasting contribution	M. Logical: consistent; rational
N. Social Recognition: respect and admiration	N. Loving: affectionate and tender
O. True Friendship: close companionship	O. Loyal: faithful to friends or the group
P. Wisdom: a mature understanding of life	P. Obedient: dutiful; respectful
Q. A World at Peace: a world free of war and conflict	Q. Polite: courteous and well-mannered
R. A World of Beauty: beauty of nature and the arts	R. Responsible: dependable and reliable

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	Not at all important to me			Very important to me		
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1. A good life for others: improving the welfare of all people in need	1	2	3	4	5	
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4. Social progress and social reform: readiness to change our way of life for the better	1	2	3	4	5	
5. A world at peace: being free from war and conflict	1	2	3	4	5	
6. A world of beauty: having the beauty of nature and of the arts (music, literature, art, etc.)	1	2	3	4	5	
7. Human dignity: allowing each individual to be treated as someone of worth	1	2	3	4	5	
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12. National economic development: having greater economic progress and prosperity for the nation	1	2	3	4	5	
13. The rule of law: punishing the guilty and protecting the innocent	1	2	3	4	5	
14. National security: protection of your nation from enemies	1	2	3	4	5	
Traditional Religiosity						
15. Salvation: being saved from your sins and a peace with God	1	2	3	4	5	
16. Religious or mystical experience: being at one with God or the universe	1	2	3	4	5	
17. Upholding traditional sexual moral standards: opposing sexual permissiveness and pornography	1	2	3	4	5	
18. Sexual intimacy: having a satisfying, monogamous sexual relationship	1	2	3	4	5	
Personal Growth & Inner Harmony						
19. Self-knowledge or self-insight: being more aware of what sort of person you are	1	2	3	4	5	
20. The pursuit of knowledge: always trying to find out new	1	2	3	4	5	

	Not at all important to me			Very important to me	
things about the world we live in					
21. Inner harmony: feeling free of conflict within yourself	1	2	3	4	5
22. Self-improvement: striving to be a better person	1	2	3	4	5
23. Wisdom: having a mature understanding of life	1	2	3	4	5
24. Self-respect: believing in your own worth	1	2	3	4	5
Physical Well-being					
25. Physical development: being physically fit	1	2	3	4	5
26. Good health: physical well-being	1	2	3	4	5
27. Physical exercise: taking part in energetic activity	1	2	3	4	5
Secure and Satisfying Interpersonal Relationships					
28. Mature love: having a relationship of deep and lasting affection	1	2	3	4	5
29. True friendship: having genuine and close friends	1	2	3	4	5
30. Personal support: knowing that there is someone to take care of you	1	2	3	4	5
31. Security for loved ones: taking care of loved ones	1	2	3	4	5
32. Acceptance by others: feeling that you belong	1	2	3	4	5
Social Standing					
33. Recognition by the community: having high standing in the community	1	2	3	4	5
34. Economic prosperity: being financially well-off	1	2	3	4	5
35. Authority: having power to influence others and control decisions	1	2	3	4	5
Social Stimulation					
36. An active social life: mixing with other people	1	2	3	4	5
37. An exciting life: a life full of new experiences or adventures	1	2	3	4	5
Individual Rights					
38. Privacy for yourself: being able to keep your business to yourself	1	2	3	4	5
39. A sense of ownership: knowing the things you need and use belong to you	1	2	3	4	5
40. A leisurely life: being free from pressure and stress	1	2	3	4	5
41. Carefree enjoyment: being free to indulge in the pleasures of life	1	2	3	4	5
42. The protection of human life: taking care to preserve your own life and the life of others	1	2	3	4	5
43. Comfort but not luxury: being satisfied with the simple pleasures of life	1	2	3	4	5

Mode Values Inventories (Braithwaite & Law, 1985)

Respond to each item by circling if it is important or not important to you.

- 1 – Not at all important to me
 2 – Not important to me
 3 – Neither important or not important to me
 4 – Important to me
 5 – Very important to me

	Not at all important to me			Very important to me		
Positive Orientation to Others						
1. Tolerant: accepting others even though they may be different from you	1	2	3	4	5	
2. Helpful: always ready to assist others	1	2	3	4	5	
3. Forgiving: willing to pardon others	1	2	3	4	5	
4. Giving others a fair go: giving others a chance	1	2	3	4	5	
5. Tactful: being able to deal with touchy situations without offending others	1	2	3	4	5	
6. Considerate: being thoughtful of other people's feelings	1	2	3	4	5	
7. Cooperative: being able to work in harmony with others	1	2	3	4	5	
8. Loving: showing genuine affection	1	2	3	4	5	
9. Trusting: having faith in others	1	2	3	4	5	
10. Grateful: being appreciative	1	2	3	4	5	
11. Understanding: able to share another's feelings	1	2	3	4	5	
12. Friendly: being neighborly	1	2	3	4	5	
13. Generous: sharing what you have with others	1	2	3	4	5	
Competence and Effectiveness						
14. Bright: being quick thinking	1	2	3	4	5	
15. Adaptable: adjusting to change easily	1	2	3	4	5	
16. Competent: being capable	1	2	3	4	5	
17. Resourceful: being clever at finding ways to achieve a goal	1	2	3	4	5	
18. Self-disciplined: being self-controlled	1	2	3	4	5	
19. Efficient: always using the best method to get the best results	1	2	3	4	5	
20. Realistic: seeing each situation as it really is	1	2	3	4	5	
21. Knowledgeable: being well informed	1	2	3	4	5	
22. Persevering: not giving up in spite of difficulties	1	2	3	4	5	
23. Progressive: being prepared to accept and support new things	1	2	3	4	5	
24. Conscientious: being hardworking	1	2	3	4	5	
25. Logical: being rational	1	2	3	4	5	
26. Showing foresight: thinking and seeing ahead	1	2	3	4	5	
Propriety in Dress and Manners						
27. Polite: being 'well-mannered'	1	2	3	4	5	
28. Patriotic: being loyal to your country	1	2	3	4	5	
29. Prompt: being on time	1	2	3	4	5	

	Not at all important to me			Very important to me	
30. Refined: never being coarse or vulgar	1	2	3	4	5
31. Clean: not having dirty habits	1	2	3	4	5
32. Neat: being tidy	1	2	3	4	5
33. Reliable: being dependable	1	2	3	4	5
Religious Commitment					
34. Committed: being dedicated to a cause	1	2	3	4	5
35. Devout: following your religious faith conscientiously	1	2	3	4	5
36. Self-sacrificing: putting the interest of others before your own	1	2	3	4	5
37. Idealistic: living according to how things should be rather than how things are	1	2	3	4	5
Assertiveness					
38. Standing up for your beliefs: defending your beliefs no matter who opposes them	1	2	3	4	5
39. Having your say: confidently stating your opinions	1	2	3	4	5
40. Determined: standing by your decisions firmly	1	2	3	4	5
Withdrawal from Others					
41. Keeping to yourself: being content with your own company	1	2	3	4	5
42. Independent: doing things on your own	1	2	3	4	5
Carefreeness					
43. Acting on impulse: doing things on the spur of the moment	1	2	3	4	5
44. Spontaneous: doing what comes naturally	1	2	3	4	5
45. Cautious: not rushing into things	1	2	3	4	5
Honesty					
46. Open: not hiding anything from anyone	1	2	3	4	5
47. Honest: never cheating or lying	1	2	3	4	5
Thriftiness					
48. Thrifty: being careful in spending money	1	2	3	4	5
49. Never missing a chance: taking advantage of every opportunity that comes your way	1	2	3	4	5
Getting Ahead					
50. Ambitious: being eager to do well	1	2	3	4	5
51. Competitive: always trying to do better than others	1	2	3	4	5

Please respond to each item by circling if it is unlike you or like you.

1 = very unlike me | 2 = unlike me | 3 = neither unlike me or like me | 4 = like me
| 5 = very like me

	UNLIKE me			LIKE me	
	1	2	3	4	5
1. I have taken frequent stands in the face of strong opposition.	1	2	3	4	5
2. I never quit a task before it is done.	1	2	3	4	5
3. I always keep my promises.	1	2	3	4	5
4. I always look on the bright side.	1	2	3	4	5
5. I am a spiritual person.	1	2	3	4	5
6. I know how to handle myself in different social situations.	1	2	3	4	5
7. I always finish what I start.	1	2	3	4	5
8. I really enjoy doing small favors for friends.	1	2	3	4	5
9. As a leader, I treat everyone equally well regardless of his or her experience.	1	2	3	4	5
10. Even when candy or cookies are under my nose, I never overeat.	1	2	3	4	5
11. I practice my religion.	1	2	3	4	5
12. I rarely hold a grudge.	1	2	3	4	5
13. I am always busy with something interesting.	1	2	3	4	5
14. No matter what the situation, I am able to fit in.	1	2	3	4	5
15. I go out of my way to cheer up people who appear down.	1	2	3	4	5
16. One of my strengths is helping a group of people work well together even when they have their differences.	1	2	3	4	5
17. I am a highly disciplined person.	1	2	3	4	5
18. I experience deep emotions when I see beautiful things.	1	2	3	4	5
19. Despite challenges, I always remain hopeful about the future.	1	2	3	4	5
20. I must stand up for what I believe even if there are negative results.	1	2	3	4	5
21. I finish things despite obstacles in the way.	1	2	3	4	5
22. Everyone's rights are equally important to me.	1	2	3	4	5
23. I see beauty that other people pass by without noticing.	1	2	3	4	5
24. I never brag about my accomplishments.	1	2	3	4	5
25. I am excited by many different activities.	1	2	3	4	5
26. I am a true life-long learner.	1	2	3	4	5
27. I am always coming up with new ways to do things.	1	2	3	4	5
28. People describe me as "wise beyond my years."	1	2	3	4	5
29. My promises can be trusted.	1	2	3	4	5
30. I give everyone a chance.	1	2	3	4	5
31. To be an effective leader, I treat everyone the same.	1	2	3	4	5

	UNLIKE me			LIKE me	
	1	2	3	4	5
32. I am an extremely grateful person.	1	2	3	4	5
33. I try to add some humor to whatever I do.	1	2	3	4	5
34. I look forward to each new day.	1	2	3	4	5
35. I believe it is best to forgive and forget.	1	2	3	4	5
36. My friends say that I have lots of new and different ideas.	1	2	3	4	5
37. I always stand up for my beliefs.	1	2	3	4	5
38. I am true to my own values.	1	2	3	4	5
39. I always feel the presence of love in my life.	1	2	3	4	5
40. I can always stay on a diet.	1	2	3	4	5
41. I think through the consequences every time before I act.	1	2	3	4	5
42. I am always aware of the natural beauty in the environment.	1	2	3	4	5
43. My faith makes me who I am.	1	2	3	4	5
44. I have lots of energy.	1	2	3	4	5
45. I can find something of interest in any situation.	1	2	3	4	5
46. I read all of the time.	1	2	3	4	5
47. Thinking things through is part of who I am.	1	2	3	4	5
48. I am an original thinker.	1	2	3	4	5
49. I have a mature view on life.	1	2	3	4	5
50. I can express love to someone else.	1	2	3	4	5
51. Without exception, I support my teammates or fellow group members.	1	2	3	4	5
52. I feel thankful for what I have received in life.	1	2	3	4	5
53. I know that I will succeed with the goals I set for myself.	1	2	3	4	5
54. I rarely call attention to myself.	1	2	3	4	5
55. I have a great sense of humor.	1	2	3	4	5
56. I always weigh the pros and cons.	1	2	3	4	5
57. I enjoy being kind to others.	1	2	3	4	5
58. I can accept love from others.	1	2	3	4	5
59. Even if I disagree with them, I always respect the leaders of my group.	1	2	3	4	5
60. I am a very careful person.	1	2	3	4	5
61. I have been told that modesty is one of my most notable characteristics.	1	2	3	4	5
62. I am usually willing to give someone another chance.	1	2	3	4	5
63. I read a huge variety of books.	1	2	3	4	5
64. I try to have good reasons for my important decisions.	1	2	3	4	5
65. I always know what to say to make people feel good.	1	2	3	4	5
66. It is important to me to respect decisions made by my group.	1	2	3	4	5
67. I always make careful choices.	1	2	3	4	5

	UNLIKE me			LIKE me	
68. I feel a profound sense of appreciation every day.	1	2	3	4	5
69. I awaken with a sense of excitement about the day's possibilities.	1	2	3	4	5
70. Others consider me to be a wise person.	1	2	3	4	5
71. I believe that it is worth listening to everyone's opinions.	1	2	3	4	5
72. I am known for my good sense of humor.	1	2	3	4	5

Teacher Self-Efficacy Beliefs Scale (Dellinger, Bobbett, Olivier, Ellett, 2008)

Please respond to the following about your professor.

Use the following scale to rate your beliefs about your professor's capabilities:

1. Weak beliefs about my professor's capabilities
2. Moderate beliefs about my professor's capabilities
3. Strong beliefs about my professor's capabilities
4. Very strong beliefs about my professor's capabilities

Right now in this class, I believe the following about my professor's capabilities to...	Weak		Strong	
	1	2	3	4
1. plan activities that accommodate the range of individual differences among students	1	2	3	4
2. plan evaluation procedures that accommodate individual differences among students	1	2	3	4
3. use allocated time for activities that maximize learning	1	2	3	4
4. effectively manage routines and procedures for learning tasks	1	2	3	4
5. clarify directions for learning routines	1	2	3	4
6. maintain high levels of student engagement in learning tasks	1	2	3	4
7. redirect students who are persistently off task	1	2	3	4
8. maintain a classroom climate of courtesy and respect	1	2	3	4
9. maintain a classroom climate that is fair and impartial	1	2	3	4
10. communicate to students the specific learning outcomes of the lesson	1	2	3	4
11. communicate to students the purpose and/or importance of learning tasks	1	2	3	4
12. implement teaching methods at an appropriate pace to accommodate differences among students	1	2	3	4
13. utilize teaching aids and learning materials that accommodate individual differences among students	1	2	3	4
14. provide students with opportunities to learn at more than one cognitive and/or performance level	1	2	3	4
15. communicate to students content knowledge that is accurate and logical	1	2	3	4
16. clarify student misunderstandings or difficulties in learning	1	2	3	4
17. provide students with specific feedback about their learning	1	2	3	4
18. provide students with suggestions for improving learning	1	2	3	4
19. actively involve students in developing concepts	1	2	3	4
20. solicit a variety of questions throughout the lesson that enable higher order thinking	1	2	3	4
21. actively involve students in critical analysis and/or problem solving	1	2	3	4
22. monitor students' involvement during learning tasks	1	2	3	4
23. adjust teaching and learning activities as needed	1	2	3	4
24. manage student discipline/behavior	1	2	3	4
25. involve students in developing higher order thinking skills	1	2	3	4
26. motivate students to perform to their fullest potential	1	2	3	4
27. provide a learning environment that accommodates students with special needs	1	2	3	4
28. improve the academic performance of students, including those with learning disabilities	1	2	3	4
29. provide a positive influence on the academic development of students	1	2	3	4
30. maintain a classroom environment in which students work cooperatively	1	2	3	4
31. successfully maintain a positive classroom climate	1	2	3	4

What is your expected grade in this course (circle one)? F D C B A

(1) How has this course impacted/changed your perspective towards yourself, others, the world, etc.?

(2) What other areas of your life have impacted/changed your perspective towards yourself, others, the world, etc.?

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