SPIRIT OR PSYCHE?
RELIGIOUSNESS IN UNDERGRADUATE PSYCHOLOGY MAJORS

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ABSTRACT

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In light of religious and worldview differences between psychologists and the general population of the United States (i.e., psychologists are generally less religious and endorse more non-traditional religious views), the researcher sought to determine whether such differences are evident at the level of undergraduate education. Using data from questionnaires administered to 3,680 undergraduate students in their junior year, the researcher compared psychology and all non-psychology majors in terms of scientism, irreligiousness, normative religiousness, humanism, spiritual struggle, and religious embeddedness. MANCOVA and ANCOVA statistical analyses suggested that psychology majors were higher on humanism and spiritual struggle than were students in all other majors; the two groups did not differ with respect to the other four variables. Psychology majors were also compared to more specific subsets of majors, including students of the natural sciences, humanities, theology/religion, business, education, engineering, and health professions. In this case, education and theology/religion majors scored lower on scientism and higher on normative religiousness and religious embeddedness than did psychology majors. On spiritual struggle, psychology majors scored higher than students of business, education, and engineering. Psychology majors were also higher on humanism than all majors except the humanities and theology/religion.

These results indicate that the differences between undergraduate psychology majors and their peers are subtle, with psychology majors tending slightly toward humanism and spiritual struggle. Two forces may further lead psychologists-in-training down their divergent religious path. First, those with greater humanism and spiritual struggle may be selectively attracted to
graduate education and a career in psychology. Second, additional educational and professional socialization may cultivate humanism and spiritual struggle, contributing to the abandonment of normative religiousness and general religious involvement in favor of either humanistic religiousness or scientism and irreligiousness.
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INTRODUCTION

Theorists and researchers have devoted considerable attention to the relationship between the disciplines of psychology and religion. Because both domains are heavily concerned with human thought, experience, and behavior, many have speculated as to whether the interaction of the two disciplines is inevitably competitive or potentially cooperative. I propose that some of the values and assumptions that underlie psychology are compatible with certain religious stances, but not others. Hence, individuals whose religious stance is compatible with psychology may be more likely to study psychology as an undergraduate major than those whose religious stance is at odds with psychology. In addition, those who study psychology may develop religious views that reflect the influences of psychology’s distinctive worldview.

Of course, the proposed relationship between religiousness and majoring in psychology would be a moot point if college students were generally not religious. However, the Higher Education Research Institute at the University of California, Los Angeles conducted a nationally representative study of 98,593 college freshmen in 2004 that suggests a large proportion of students hold religious beliefs and attitudes (Astin et al., n.d.). Most students said they believed in God (79%), prayed (69%), and had an interest in spirituality (80%). Forty percent reported they considered seeking to follow religious teachings in their everyday life to be very important or essential. The prevalence of religiousness among college students opens the door to possible links between this phenomenon and other variables.

To set the stage for this study, I will lay out the evidence that psychologists’ religiousness differs from that of the larger American population and that these differences have important implications. Then, I will describe the distinctive values and assumptions held by psychology and compare them to three religious stances. Next, there follows a discussion of the role that
beliefs and attitudes play in career selection. After reviewing another pair of variables suspected to relate to the choice of psychology as a major, I will articulate several hypotheses and a plan to test them.

Before continuing, it is important to touch upon the definition of religion. Zinnbauer et al. (1997) wrote about the problems researchers face in defining religion and distinguishing it from spirituality. In an empirical study of diverse groups, they showed that for some groups religion and spirituality were sharply opposed to each other, whereas other groups conceptualized the two as significantly overlapping. In 1999, Zinnbauer, Pargament, and Scott commented on the growing tendency to view religion and spirituality as polar opposites. They reported that spirituality is often considered the realm of personally valued existential principles that provide meaning, interpersonal connectedness, and growth. Conversely, religion has a reputation for imposing doctrines and rules, as well as hampering personal development. The authors contended that such polarization is a cultural artifact and should not replace the more traditional view of religion, which includes personal, emotional aspects as well as organizationally prescribed behaviors and cognitions. In fact, the usefulness of spirituality self-ratings has been called into question. In a review of the literature about how people conceive of religion and spirituality, Marler and Hadaway (2002) suggested that being spiritual is taken for granted; when most people claim to be only spiritual, they may not be claiming to be highly spiritual but simply less religious than others.

Due to these problems in differentiating religion from spirituality, I have adopted Pargament’s (1997, p.32) definition of religion as “a search for significance in ways related to the sacred.” In this context, “significance” refers to that which is valued as ultimately important. “The sacred” is any supernatural or divine element of reality, as well as any aspect of life imbued
with higher qualities due to its perceived association with the divine. I believe this approach is useful because it is concise, yet conceptually broad enough to cover a wide range of phenomena. According to this definition, spirituality is the search for the sacred itself and thus the essential function of religion. I will not, however, distinguish between religion and spirituality in this study and will use the terms interchangeably.

Psychologists and Religion

One way researchers have attempted to understand how religion and psychology interact has been to investigate psychologists’ personal religiousness, particularly in comparison with the religiousness of other populations. In the early 1900s, Leuba selected a group of physical scientists, biological scientists, historians, sociologists, and psychologists and asked them whether they believed in God and immortality (Leuba, 1916, as cited in Brown, 2003). The psychologists reported the lowest levels of belief in God (only 24.2% indicated such belief) and immortality (19.8%). In contrast, historians and physical scientists were much more likely to believe in God (48.3 and 43.9%, respectively) and immortality (51.5 and 50.7%, respectively). Five decades later, Marx and Spray (1969) compared the proportions of religious affiliations among clinical psychologists in three major U.S. cities with figures from U.S. census data in 1957 and 1958. In the American population, approximately 94 percent of respondents had identified themselves as Protestant, Catholic, or Jewish; approximately 40 percent of clinical psychologists identified themselves as atheist, agnostic, or as having no religious position, a proportion much higher than would be expected given the census figures. Studies by Bergin and Jensen (1990) and Shafranske and Malony (1990) found that the percentage of clinical psychologists who reported personal agnosticism, atheism, or lack of religious preference was three times greater than the percentage of Americans who claimed no religious preference in a
1984 Gallup Poll (Religion in America, 1985, as cited in Bergin & Jensen, 1990). (However, according to these same studies, the rates of regular participation in organized religion for clinical psychologists and the general population are similar.) The American public was more than twice as likely (74% versus 33%) to agree or strongly agree with the statement, “My whole approach to life is based on my religion,” than were the clinical psychologists (Bergin & Jensen). Only two fifths of clinical psychologists affirmed belief in a theistic or deistic god in Shafranske and Malony’s study. Bilgrave and Deluty (1998) studied a sample of clinical and counseling psychologists, 59% of whom identified themselves as mainstream Protestant, Catholic, Jewish, or Fundamentalist Christian; sixty-six percent claimed to believe strongly or very strongly in “God or a Universal Spirit.” This percentage is substantially smaller than the 94% of Gallup poll participants who endorsed such beliefs in 1999 (Gallup, Inc., n.d., Religion, table 13).

Although these findings vary in terms of the specific prevalence rates of religious belief among psychologists, they all suggest that psychologists do differ from the American population when it comes to religiousness. Even though the two groups may show similar patterns of participation in organized religious activities (Shafranske & Malony, 1990), psychologists are less likely to identify themselves as Christian, to believe in God, and to make religion the primary guiding force in their life.

Potential Effects of Religious Differences

One might ask whether these differences have any significant implications for the science and practice of psychology. There are a number of reasons to suggest that they do, particularly with respect to the realm of psychotherapy. Most psychotherapists agree that therapist values influence treatment and that values cannot be extricated from the therapeutic process, although they are divided as to whether the impact of values is desirable (Norcross & Wogan, 1987).
Likewise, according to a survey of clinical psychologists, the majority acknowledged that the client’s religion and spirituality influence therapy; that it is important to know the client’s spiritual background; and that it is acceptable for therapists to address religion in treatment (Shafranske & Malony, 1990). However, these same psychologists also reported that the training they received did not adequately prepare them to work through these issues with clients. Perhaps more importantly, psychotherapists may subtly and even unintentionally undermine their clients’ religious beliefs and values.

Differences between psychological researchers and the general population could also create certain problems. The metaphysical assumptions of scientists influence their approach to research and the theories they construct (O’Donohue, 1989). If psychological scientists cannot understand or empathize with religious views that are central to a significant portion of society, their theories may fail to accurately reflect the experiences of their subjects. Further, public policy based on biased psychological findings may be at odds with the values of the very people those policies are supposed to benefit.

Of course, not all psychology majors select psychology as a career. Even so, psychology has the potential to influence the broader culture through students who are confronted with a psychological worldview. Psychology courses are offered in high schools around the country and many colleges require students to take a course in psychology. Students may therefore be exposed to values and religious views that contradict their own, possibly producing changes in their personal worldviews. In the 2005-2006 academic year, nearly six percent of all bachelor’s degrees conferred were degrees in psychology; indeed, psychology was the fifth most common degree specialization (National Center for Education Statistics, 2008). This great number of psychology majors, regardless of whether they pursue a career in psychology, may augur greater
diffusion of psychology’s attitudes toward religion. In addition, studying subject matter that opposes one’s own beliefs may create cognitive dissonance and emotional distress among religious students of psychology. Colleges that require taking a psychology course could thereby unwittingly cause significant anguish in a substantial proportion of their students.

Psychological Values

The present study is founded on the assumption that the distinctive religious stance of psychologists reflects psychology’s particular set of core values. These values and their corresponding religious stances may be prominent even among undergraduate psychology majors.

Scientism. One group of values that lies at the core of psychology came to the fore during the latter half of the second millennium. In the Age of Reason, antipathy toward religion and a desire to explain the universe in terms of natural phenomena were widespread among intellectuals (Richards & Bergin, 1997; Stark, 1999). Various philosophical assumptions were made that effectively precluded the existence of the supernatural (Richards & Bergin; Slife, Hope, & Nebeker, 1996). For example, materialism held that matter is all that exists. According to naturalism, everything that occurs is the result of the interaction of matter following natural laws. These laws were said to hold true everywhere and at all times (universalism). Many believed that the only way to obtain true knowledge is to rely on sense perception (empiricism). “Scientism” is an appropriate name for this mechanistic framework, which portrays concepts such as God as impossible and unknowable while promoting science as the only conduit of ultimate truth.

At the same time that science was purging religious and spiritual ideas from its paradigm, certain intellectuals began to look upon the study of the mind as a tool for eradicating religion
(Stark, 1999). Thinkers such as David Hume, the Earl of Shaftesbury, and John Trenchard believed that the investigation of human thoughts and beliefs would help explain away religion. The new discipline of psychology would take the place of religion by teaching humanity what it should value (Shaftesbury, [1711] 1978, as cited in Stark). Through the years, religion was portrayed as irrational, the result of rigid thinking and psychological disorder. The atheism of influential, high-profile figures such as Freud, Skinner, and Ellis is well known (see Richards & Bergin, 1997; Jones, 1994; Bergin, 1980) and demonstrates how pervasive irreligiousness is throughout the range of psychology’s theoretical systems.

In the late 1800s and early 1900s, psychologists’ desire to attain the status of natural scientists led them to adopt the natural science framework that ruled out God (Hood, 2000; Richards & Bergin, 1997). Even in the area of the psychology of religion, it was G. Stanley Hall’s approach (one that “favored empirical methods… [and] quantitative findings from questionnaire studies combined with naturalist reductionistic explanations;” Hood, p. 532) that won out over William James’s appreciation of methodological pluralism and openness to metaphysical issues.

Slife et al. (1999) contend that by modeling psychology’s methods after those of physics, psychologists reinforced the notion that science and religion are necessarily opposed to each other. The assumptions outlined previously have dictated the way in which scientific research is conducted. According to Slife et al., theories that presume a different type of universe, one in which the supernatural may exist, cannot be easily tested using the naturalistic paradigm. Such theories must either be discarded as worthless or distorted in order to fit the naturalistic mold. When naturalistic researchers obtain results, they will interpret those results according to assumptions that have already excluded a range of explanations (i.e., those that are not
reductionistic). To summarize the argument of Slife et al., the dominant research process serves to filter out conclusions that do not agree with naturalistic assumptions at the conceptual, operational, and interpretive levels, giving scientism an a priori advantage over other philosophical positions.

The evidence for scientism in psychology presented by the aforementioned authors (i.e., Bergin, 1980; Hood, 2000; Richards & Bergin, 1997; Slife et al., 1999; and Stark, 1999) is admittedly historical and philosophical. To my knowledge, there are no empirical studies on psychologists’ philosophy of science or how the scientific method constrains psychological theory and research. Nevertheless, the evidence that exists is at least sufficient to support the hypothesis that scientism may be an influential force in psychology. To be sure, not all psychologists adhere to strict scientism. Prominent psychologists such as William James have questioned the tenets of scientism (Hood). Postmodernism currently stands as a challenge to the claim that empirical observation provides objective truth, thus opening the door for psychologists to consider other sources of truth (Richards & Bergin). Even if scientism is dominant among psychologists, it is not the only paradigm in psychology.

Self-fulfillment. Another group of values that is central to psychology pertains to “self-fulfillment.” Ethical relativism and hedonism, as logical outgrowths of scientism, became the foundation of psychology’s morality (Richards & Bergin, 1997). From the perspective of scientism, one might reason that because moral absolutes are not physical entities and cannot be observed, science has no place for them. Moreover, without an obligation to obey external rules, it seems that humanity is free to pursue pleasure in all of its various forms. A number of authors have proposed that psychology’s rejection of the concepts of sin and remorse for sin, viewing
them as undesirable and incompatible with psychological health, is evidence of the influence of these ethical positions (Bergin, 1980; Haque, 2001; Watson, Morris, & Hood, 1987).

Bergin (1980) has made the case that psychology tends to promote an optimistic view of human nature. In this view, humans create their own moral standards. As Bergin explains, psychotherapy emphasizes helping clients to fulfill their own needs and self-actualize. It seems that this implies the belief that humans are basically good. Bergin further notes that psychology often blames external factors for personal problems, which arise only when circumstances or other people frustrate self-fulfillment or cause the individual to seek it in an inappropriate manner. If Bergin is correct, one would expect researchers in psychology to concern themselves with identifying thoughts, feelings, and behaviors that maximize pleasure and reduce pain, with therapists helping clients put these insights into practice. Clinicians would tend to work with clients to clarify and effectively pursue personal values rather than to conform to moral standards of behavior.

Some research does bear out Bergin’s (1980) view. A content analysis of articles in American Psychologist and the Journal of Social Issues conducted by three raters of varying political views found that 97 and 96 percent of the articles in the respective journals favored politically liberal views (Redding, 1997). Tomkins (1987) described political liberalism as resting on a faith in human goodness, so Redding’s finding implies that psychologists may lean heavily toward such faith. Fowers and Tredinnick (1997) obtained more direct evidence when they asked 229 practicing therapists to read brief case vignettes and select their preferred approach to treating each case; the majority indicated they would encourage the pursuit of self-determined values and would emphasize the client’s personal strength and potential. Among adult Israeli parents of adolescents, those who were psychologists had a moderate tendency to
endorse the values of universalism and self-direction while rejecting tradition (Knafo & Sagiv, 2004). These results suggest that psychologists oppose traditional constraints on behavior, view diverse lifestyles as equally valid, and believe that the individual should make personally valued decisions.

Yet, other studies temper the conclusion that psychology unanimously champions self-fulfillment over moral standards. Four fifths of the empirical studies (selected from the *Journal of Personality and Social Psychology*, *Psychological Bulletin*, and *Psychological Review* volumes published in 2000) in another content analysis (Campbell et al., 2003) were deemed politically neutral, which may mean that the field of psychology is not as totally liberal as Redding (1997) claimed or that psychologists’ liberal views do not generally influence their empirical findings. Further, Kernes and Kinnier (2005) classified 39 percent of psychologists in their sample as moral absolutists, who hold that there are universally applicable moral principles.

In addition, there are two potential challenges to the portrayal of psychology as thoroughly self-centered. First, it may be that self-fulfillment is particular to a limited number of therapeutic orientations, whereas other approaches are ostensibly less self-centered. Self-fulfillment is most obvious in humanistic psychotherapy, with its emphasis on self-actualization and unconditional positive regard for clients. Self-fulfillment may be less evident in orientations such as behaviorism and psychoanalysis. Yet one could argue that Skinnerian behaviorism, by making reward seeking the central principle in therapy, tacitly validates the human desires behind behavior as essentially morally acceptable. Psychoanalysis similarly focuses on achieving insight into drives rather than assessing their morality. Hence even orientations that differ in many respects from one another may treat basic human desires as worthy of being satisfied.
A second possible challenge is that self-fulfillment values, and morality in general, are only relevant to psychological practice; in other words, research may be more value neutral. After all, scientists are frequently believed and even encouraged to pursue knowledge without being influenced by unscientific value systems. Likewise, scientific knowledge is itself presumed to transcend notions of morality. It is only in the application of knowledge, according to common thought, that values enter into the equation. Leary’s (1980) review of the moral basis of modern psychology challenges this assertion. Leary traces psychology back to Descartes and Locke, both of whom saw in psychology the potential for rationally and empirically discovering the moral system underlying nature. Referencing the personal views of numerous giants in the field, Leary asserts that establishing a new morality has remained a strong motivation among research psychologists, including those whose work often seems to have little to do with moral issues. Appealing to reason and observation as the foundations of morality is a meta-ethical position, ultimately conferring the responsibility of moral self-determination upon humanity. In this way, psychological scientists’ research may contribute to psychotherapists’ promotion of self-fulfillment.

The studies reviewed represent only a portion of the existing literature concerning psychologists’ beliefs and values. Even so, they do illustrate the possibility that one common psychological anthropology idealizes humanity and favors personal choice in moral matters.

Religious Stances

It seems reasonable to suspect that those who accept the core values espoused by psychology would be more likely than not to hold religious and spiritual attitudes that are consistent with those values. In this study, three main types of religiousness will be discussed in relationship to the core values of psychology: irreligiousness, normative religiousness, and
humanistic religiousness. Before I describe these stances, I provide a graphic model to help the reader visualize their relations to one another.

Figure 1: Graphic Model of Constructs

Figure 1 presents a diagram consisting of two intersecting dimensions, namely religiousness/irreligiousness and humanism/normativism. An individual high on normativism and religiousness is considered normatively religious. High humanism and religiousness characterize humanistically religious people. Low religiousness, or irreligiousness, could be divided into the normative and humanistic varieties but, for reasons explained later, will not be thus broken down.

The other two components of the model, scientism and self-fulfillment, correspond to the psychological values postulated; their placement symbolizes how I expect them to relate to the religiousness and humanism/normativism dimensions. Scientism is a subtype of irreligiousness. Self-fulfillment is a facet of humanism and may be valued by both the religious and irreligious.
The overlap between scientism and self-fulfillment represents individuals who are high in both and implies that such cases should score highly in general humanism and irreligiousness.

Irreligiousness. According to the model, an irreligious worldview is compatible with the core psychological values described above. Irreligiousness is defined here as essentially a negation of belief in the supernatural or transcendent. Truly irreligious individuals express little or no interest in spiritual matters. Someone who does not accept or have access to religious explanations of the universe could understandably compensate by turning to the scientism in psychology. Scientism attempts to answer some of the ultimate questions usually dealt with by religion, such as how life originated. Without religiously based moral principles, the irreligious might turn to psychology’s emphasis on self-fulfillment for guidance.

Normative Religiousness. In contrast, those who hold a more normative religious perspective (Tomkins, 1963, as cited in De St. Aubin, 1996) should be more likely to reject the core values of psychology. This perspective is often what is meant when the word “religion” is mentioned and has been described in various ways by a number of psychologists (e.g., Frank, 1977; Fromm, 1950; Tomkins, 1987). Because much psychological writing about religion has taken place in the context of predominantly Christian cultures, the normative religion described contains many Christian themes. As such, it may be difficult to determine how well the concept of normativism translates to other religions. I do, however, believe that other religions and sects could fit this category. In any case, the current study draws on an American sample, in which the Christian brand of normative religion will likely be the most salient form. It should therefore not be necessary to make fine distinctions between multiple varieties of normativism for this sample.

The God of normative religion is the transcendent source of all reality and virtue. This is an authoritarian God, a powerful being worthy of fear, respect, and obedience (Fromm 1950), but
also often of love. Order is a primary concern for the normative God, so disobedience or sin is not to be tolerated indefinitely (De St. Aubin, 1996; Fromm). Typically, a body of literature or tradition that is supposed to have been divinely revealed serves as the fountain from which knowledge about the nature of God and the universe issues (Frank, 1977). Believers may be skeptical about knowledge derived through human effort, claiming that humans are determined to distort the truth in order to facilitate rebellion against God; furthermore, sense perception and human reason are frequently considered unreliable sources of information (Frank).

Normative religion sets up a stark contrast between God and humanity. While God possesses all power and virtue, humans are weak, rebellious, and self-centered (De St. Aubin, 1996; Fromm, 1950; Tomkins, 1987). The greatest good for humans is a restored relationship with God, which can only be achieved by acknowledging their sinfulness and dependence upon God (Fromm). Adherents of normative religion are obligated to live according to divine law, which usually includes a command to do good deeds (or not to do evil) to others (Frank, 1977). Such a worldview seeks to relegate the pursuits of pleasure and material well-being to a lower level of priority because they are a distraction from eternal existential concerns (Frank).

Because a transcendent God who supersedes and even intervenes in nature is central to normative religion, disciplines such as psychology that, whether implicitly or explicitly, reject the supernatural should be anathema to the normatively religious. When research and theory seem to contradict divinely revealed truth, such individuals might choose to set aside scientific beliefs. In addition, the assumption of moral laws contradicts ethical relativism and hedonism. One who follows a normative religion would likely have difficulty in counseling clients to trust in themselves and do what seems right to them, for normatively-oriented therapists believe that the clients’ natural tendency is to engage in activities that are ultimately detrimental to
themselves. Although psychology attempts to help people feel better, if the message and the method of psychology are not considered to contribute to the knowledge of God and God’s will, normatives will probably find their vocations elsewhere.

However, normativism is not the only religious stance, and it is possible that psychology is in conflict with only a certain type of religion. In fact, Bergin and Jensen (1990) reported that 65% of clinical psychologists agreed or strongly agreed with the statement, “I try hard to live my life according to my religious beliefs.” While a mere 18% of clinical psychologists in another study (Shafranske & Malony, 1990) said that they primarily followed an organized religion, 51% described their spirituality as an “alternative spiritual path which is not part of an organized religion.” These individuals may subscribe to a third type of religious attitude that has been described in the literature – humanistic religion (De St. Aubin, 1996; Fromm, 1950; Tomkins, 1987).

Humanistic Religiousness. Whereas irreligion denies the supernatural, and normative religion worships a supreme deity, humanistic religion perceives divinity as present in humanity (Tomkins, 1963, as cited in De St. Aubin, 1996). According to this perspective, all humans possess aspects of the divine, regardless of what they do. Their divinity is equivalent to personal power and virtue. Humans’ mistakes and destructive behavior are therefore not the results of any inherent flaws, but of a failure to recognize and act in accordance with their spiritual nature (Fromm, 1950). If they not only love themselves as individuals but also appreciate their connection with all of humanity and the universe, they will actualize their potential for good (Fromm). Self-exploration takes on a sacred quality for the humanistically religious.

These believers downplay the importance of external rules and are skeptical of dictates and doctrines that purport to have divine origin (Tomkins, 1963, as cited in De St. Aubin, 1996).
Hence, they tend to be morally permissive, allowing people to determine for themselves what is right (Tomkins, 1987). On the other hand, because they consider themselves part of a greater whole, they generally prohibit harming others and encourage beneficence (Tomkins, 1965, as cited in Tomkins, 1987). Humanistic religion has as its goal the flourishing and happiness of humanity on Earth. Trusting in people’s potential to improve themselves and their conditions, adherents of humanistic religion are devoted to increasing material well-being (Frank, 1977) while embracing personal individuality and collective diversity.

Many of the humanistic religious themes are very similar to the core values in psychology. There is also significant overlap with irreligion, since both the religious and the irreligious can appreciate self-fulfillment. For Enlightenment thinkers, a secular form of humanism was the popular alternative to the normative religion that was dominant at the time. Even in Tomkins’ normative-versus-humanistic ideological polarity model, the opposing ideologies each contain both religious and non-religious versions (Tomkins, 1963, as cited in De St. Aubin, 1996; Tomkins, 1965, as cited in Tomkins, 1987). One major distinction between the two ideological poles is their attitude toward human nature, with normativism taking a more negative view and humanism taking a more positive view. Normativism presupposes an external standard to which humans must compare themselves (and of which they fall short). It is difficult to conceive of such a standard that has no foundation in religion, and many of those who hold the normative view seem to be religious. Therefore, this study does not investigate the normative form of irreligion. Humanism, on the other hand, is evident in both its religious and irreligious forms. Religious and irreligious humanists share similar values but purely irreligious humanists deny that there is a supernatural significance to existence.
The model presented in this study is proposed as a way to supplement the literature on psychologists’ religious persuasions. Other studies have looked at whether psychologists are religious or not by asking questions about affiliation, participation in religious activities, and self-rated importance of religion (e.g., Bergin & Jensen, 1990; Marx & Spray, 1969; Rubinstein, 1997). These approaches fail to capture finer distinctions in spirituality that may have important implications. In contrast, Shafranske and Malony (1990) asked participants to respond to ideological statements about the nature of the divine. Bilgrave and Deluty (1998) targeted specific beliefs, assessing factors such as atheism, Eastern/mystical religion, Christian orthodoxy and fundamentalism, and religious liberalism and abstractness. I believe the latter two studies yielded deeper insights than the others, and it is my intention to build upon their accomplishments. Perhaps the model I propose will better account for those psychologists who are neither traditionally religious nor purely irreligious. More importantly, this study may clarify how early in the process of occupational development that psychologists begin to differ religiously from their counterparts and whether religion plays a role in the choice of psychology as a major.

Career Choice, College Major, and Values

The foregoing discussion has rested on certain assumptions about individuals’ behaviors related to choosing an occupation. Namely, I have assumed that personological variables influence career choice. Personological variables include a wide range of constructs: traits, roles, belief systems, and values. Stryker and Serpe’s (1994) outline of the nature of identity provides insight into how personological variables function. They conceive of an individual’s sense of self as consisting of multiple identities – frameworks detailing how to think, feel, and act in different contexts. Certain situations elicit certain types of identity, but any given identity may be enacted
in a variety of situations. In their view, if a particular identity is highly central to a person’s sense of self and the failure to enact that identity is associated with significant costs, the person will likely spend more time in that identity, even across contexts. Personological variables originating in one context may therefore have influences in apparently unrelated contexts. Although religion and work may at first appear to represent unrelated contexts, it is possible for individuals (especially those for whom religion is highly central and salient) to permit religious identity factors to affect their work life. Conversely, work may influence religion.

In order to illustrate the relationship personological variables such as religiousness may have with the world of work, I will discuss findings linking personal values to career behaviors. I chose to examine values because I believe they share similarities with religious worldviews (which also entail certain values) and relate in a similar manner to career.

Values

Sagiv’s (2002, p.234) definition of values as “cognitive social representations of basic motivational goals [that] serve as guiding principles in people’s lives” captures common themes expressed in the values literature. There exist several different value typologies (e.g., Rokeach, 1973; Schwartz, 1992) but the same foundation underlies them all – the desire to fulfill certain needs. Individuals may value tangible and intangible goods, behaviors, or states. Davidson and Caddell (1994) argue that some values, such as religious values, cannot be explained in terms of self-interest. Researchers suggest that basic values are abstract (Shim, Warrington, & Goldsberry, 1999); that people’s value hierarchies differ (Judge & Bretz, 1992); and that the manifestation and priority of values may vary as a function of context (Brown & Crace, 1996).

There is evidence that both basic values, which are stable across situations, and work values, which are specific to the context of work, are interrelated (e.g., Roe & Ester, 1999;
Laudeman & Griffeth, 1978; Ros, Schwartz, & Surkiss, 1999). For example, Williams (1972) found that graduate students’ work values as measured by Holland’s (1985, as cited in Williams) RIASEC model corresponded to analogous life value dimensions on the Allport-Vernon-Lindzey Study of Values scale (AVLSV; Allport, Vernon, & Lindzey, 1970, as cited in Williams). In another study, the predisposition toward structured, familiar work was related to the more general appreciation for tradition and conformity, whereas a desire to work with people was associated with a broader concern for others’ well-being (Sagiv, 2002). While values may not hold across all situations and some may be strictly context-bound, it is also clear that work values and broader values are not orthogonal; concerns not strictly related to work could conceivably influence behavior in the occupational realm of life.

**Shared Values within Work Groups**

The current study asserts that people in certain occupations tend to be similar in terms of various personological variables, a position advanced by numerous other researchers (e.g., Guimond & Palmer, 1996; Knafo & Sagiv, 2004; Schneider, Smith, Taylor, & Fleenor, 1998). Focusing on the organizational level instead of the career level, Schneider (1987) and his colleagues (Schneider, Goldstein, & Smith, 1995) have written extensively about the Attraction-Selection-Attrition Model, which describes processes that result in personal similarities among members of the same organization. This model claims that the founder of an organization draws upon his or her own personality characteristics to establish the goals (or values) toward which the organization works and the means by which it strives to reach these goals. Individuals who share the values of an organization are attracted to it. The organization screens out those who do not conform sufficiently to its values during the selection process. As time moves on, employees with less than optimal commitments to the values leave the organization. Consequently, the
organization’s collection of personalities grows increasingly homogeneous. Although this model was intended to apply to organizations, it is not unreasonable to suspect that a similar principle might operate within career fields. Note, however, that the degree of homogeneity attainable in an organization is probably greater than that of an occupation simply because members of an organization are bound more closely together and interact more frequently (Denton, 1999).

There is considerable evidence in support of this model (see Schneider et al., 1995). Furthermore, some evidence indicates that this model holds for occupations (e.g., Schneider, 1994, as cited in Schneider et al., 1995). Employees who reach the level of upper management in an organization tend to have similar personality types; specific industries like telecommunications and health care show weak tendencies toward personality homogeneity among managers, and these industries can be differentiated in terms of managerial personality (Schneider et al., 1998). Because value congruence between individuals and their work environment is associated with job satisfaction (Meglino et al., 1989, as cited in Judge & Bretz, 1992), employees of the same organization who share the values of that organization are likely to be happier at work. Judge and Bretz (1992) found that when participants had values that matched those of a hypothetical job, they were more likely to accept an offer of employment. The basic values of universalism, benevolence, and self-direction have been positively correlated with the work environment’s level of social orientation (Knafo & Sagiv, 1994). On the other hand, such general personal values may only indirectly determine job acceptance through mediating variables such as more specific career attitudes (Shim et al., 1999).

Personological variables are related not only to the organization or career in which one works, but also to one’s college major. Students in different majors or departments tend to hold different basic and work values. Laudeman and Griffeth (1978) administered Holland’s
Vocational Preferences Inventory (VPI; Holland, 1965, as cited in Laudeman & Griffeth), which measures respondents’ preferences for six different types of work (e.g., intellectual, realistic, and artistic), and the AVLSV (Allport et al., 1970, as cited in Laudeman & Griffeth), which assesses respondents’ endorsements of six primary motives in life (e.g., religious, aesthetic), to 316 male undergraduate students. The students were in six different academic concentrations, each of which was theorized to correspond to one of Holland’s categories. The results revealed that vocational preferences varied significantly across majors (with $F$-values ranging from 3.29 to 41.09) and that each major had a hierarchy of preferences (with $F$-values ranging from 20.08 to 57.03). Williams (1972) also used the VPI (Holland) and the AVLSV (Allport et al.) in a study of 145 male graduate students from eighteen departments in an American university. She classified the departments according to Holland’s categories and found she was able to predict department membership from both vocational preference and more general life values using discriminant analysis. Similarly, environmental studies majors have demonstrated higher levels of environment-related values than other majors (Sherburn & Devlin, 2004).

The same processes that contribute to value homogeneity within organizations and career fields (Schneider, 1987) could operate at the college level. A college major may selectively attract individuals who endorse values particular to that discipline. On the other hand, forces within the major may socialize the student toward the values approved by the major.

**Selective Attraction**

It appears that by the time students enter college, they have a set of values that influences their decision making with respect to major. According to Ben-Shem and Avi-Itzhak (1991), the work values of 231 Israeli college freshmen preparing to work in helping professions (e.g., occupational and physical therapy, special education) differed from the values of 255 of their
peers in other majors. The two groups’ average scores on the Work Value Inventory (Super, 1970, as cited in Ben-Shem & Avi-Itzhak) were significantly different, with students in the helping professions more strongly valuing altruism (M = 4.50 versus M = 3.80, p < .001) and associating with other people (M = 4.03 versus M = 3.83, p = .003) in comparison with other majors.

Weller and Nadler (1975) also found value differences between freshmen students in different majors. They compared the scores of 80 freshmen in two Israeli universities on a revised version of the F scale (Lee & Warr, 1969, as cited in Weller & Nadler; Adorno et al., 1959, as cited in Weller & Nadler), a measure of authoritarianism. These students must select a major upon entry into the university, so any differences between them existed prior to socialization at the university. The psychology and philosophy majors had significantly lower authoritarianism scores than the biology, chemistry, and engineering students (t = 6.35, p < .001). In combination with the study by Ben-Shem and Avi-Itzhak (1991), this study supports the idea that students with different values are attracted to different majors.

Evidence for value stability would also support the selective attraction hypothesis, since differences between majors could not be attributed to socialization. In a cross-sectional study of freshman and senior students in the UK, social science majors scored higher on anti-industrial values than the other majors (F = 4.557, p = .034) and there was no significant difference between the values of the freshman and senior students within any given major (Duff & Cotgrove, 1982). Even though this study does not provide direct support for the stability of values, one would expect upper-year students to differ from new students if socialization truly affected values during college. In a similar vein, Spanish education students’ ratings of the importance of values such as self-transcendence, self-enhancement, and openness to change were
equivalent to teachers’ ratings (for each comparison of group means, $t > 7.5, p < .001$) (Ros et al., 1999). These findings are merely suggestive of the stability of values, but they should not be ignored. They indicate that students’ values are formed before extensive socialization in their particular field.

Nonetheless, the relationship between values and choice of major may be obscured by other variables. Six hundred and seventy-five freshmen in an American state college took Rokeach’s (1960, as cited in Merlo, 1985) 40-item Dogmatism Scale (Merlo). At first glance, criminal justice majors demonstrated higher levels of dogmatism than non-majors ($t = 2.35, p = .009$). However, the criminal justice majors were mostly males, who were more dogmatic than females ($t = 5.13, p < .001$), which may account for this finding. Also, female criminal justice majors were no more dogmatic than female non-majors ($t = .61$). Merlo’s findings convey the importance of taking covariates of values and major into consideration.

Socialization

Similarities between individuals in the same organization, career, or major may result from socialization rather than selective attraction. Chatman (1991) assessed the organizational value preferences of entry-level auditors in eight different firms at the beginning of their employment and ten to twelve months later. She compared the auditors’ values to the values that a group of managers and partners indicated as central to their particular firm to obtain a measure of person-organization fit. Although formal training was unrelated to person-organization fit at the end of the auditors’ first year, time spent at firm-sponsored events and with professional mentors both predicted person-organization fit at Time 2 ($\beta = .31$ and $\beta = .25$, respectively; $p < .01$). A cross-sectional study comparing public sector managers to private sector managers in Canada and Japan has shown that one’s career may influence not only work-related values but
also basic values (Becker & Connor, 2005). In both samples, the differences between public and private sector managers were more pronounced among the older managers, suggesting that the public and private sectors socialize managers toward different values. Social work students evaluated at the end of their fourth year in school and one year after graduation demonstrated an increase in favorable attitude toward socialism (from 56 to 70% endorsement), representing a shift toward the attitudes of their instructors (73%) and veteran social workers (81%); such a change may be ascribed to socialization within the career field itself (Enoch, 1989).

As with the relationship between career and values, the relative degrees to which selective attraction and socialization account for value similarities among students in a given major are not firmly established. According to Enoch’s (1989) study, the attitudes of beginning social work students toward socialism were similar to those of their instructors (83% versus 76% favoring socialism), whereas the attitudes of more advanced social work students and their instructors differed significantly (60% versus 76%). This apparent shift away from their professors’ ideology was also a shift toward the attitudes dominant among fellow students in other social science majors (50% versus 51%). Entry-level students had much less faith in people than did their professors (46% versus 86% expressing such faith), as did more advanced students (41%). These results raise questions about professorial impact on students’ beliefs and indicate that, in some cases, peers may be more influential than instructors.

However, Guimond and Palmer (1996) have found stronger evidence for ideological socialization at the level of college major. They asked first-year students in commerce and the social sciences whether the poor and unemployed are to blame for their own circumstances or whether societal systems cause poverty, posing the same questions to these students two and a half years later. The students also reported their attitudes toward groups such as socialists and
capitalists. Commerce and social science students did not exhibit ideological differences at Time 1, but at Time 2 commerce students had decreased in terms of system-blame, resulting in a significant difference between commerce and social science students; likewise, social science students decreased in person-blame, resulting in a significant difference between commerce and social science students. Further, correlations between person-blame, system-blame, and attitudes toward forces for social change (e.g., socialists) and forces supporting the status quo (e.g., capitalists) increased in strength from Time 1 to Time 2. For example, person-blame and system-blame were not significantly correlated at Time 1, but were significantly negatively correlated ($r = -.31$) at Time 2. The negative correlation between system-blame and favorable attitudes toward capitalists grew stronger (from $r = -.15$ to $r = -.34$), as did the positive correlation between system-blame and positive attitudes toward socialists (from $r = .32$ to $r = .54$). Guimond and Palmer contend that these changes signify a shift from compartmentalized beliefs and attitudes toward ideologically integrated belief systems and that this shift was the result of socialization.

Thus, although certain college majors may be associated with distinctive values, ideologies, and beliefs, these characteristics may be brought to the major by the students or inculcated in the students by the major.

**Career Choice and Religion**

In light of the evidence that values influence work-related behaviors and decisions, one might ask whether religion is related to values. Stark (1963) reported that for graduate students, religiousness (as indicated by claiming a religious affiliation and reporting frequent church attendance) was inversely related with self-identification as an intellectual, valuing self-expression, and valuing one’s reputation among fellow scholars. Traditional religiousness (assessed by self-rated importance of principles such as “being saved from [one’s] sins and at
peace with God”, and “opposing sexual permissiveness and pornography”; Braithwaite & Law, 1995) and obedience, honesty, and self-control formed a cluster of values in a 1977 sample of 465 introductory psychology students at an Australian university (Braithwaite, 1998). Among 172 students taking an Introduction to Psychology course at an American university, an extrinsic religious orientation, in which one values religion for the material support and social status that it can provide, frequently co-occurred with an extrinsic orientation toward work (Lewis & Hardin, 2002). In contrast, the same study found no correlation between the intrinsic religious and work orientations. Despite mixed findings, there is at least some support for the argument that religion and values go hand in hand.

Researchers are increasingly cognizant of the importance of religion and spirituality in the sphere of work and a number of models have attempted to integrate these concepts into career development frameworks (Duffy, 2006). Garcia-Zamor (2003) notes that people often view their work as a means of self-expression. The religiously committed are more likely to construe work in terms of a “calling” by God to perform tasks unselfishly for a greater good (Davidson & Caddell, 1994). Incorporating spiritual considerations into business operations may serve to deepen individuals’ understanding of and commitment to ethical behavior (Garcia-Zamor). Garcia-Zamor declares that employers are growing more receptive to the notion of actively integrating personal values into work life.

For the present study, it is the relationship between religion and preparation for a career through higher education that is in question. Departing from the industrial/organizational literature’s emphasis on the importance of values specifically related to work in predicting work behavior, Shim et al. (1999) have made the case that general values may be more useful in conducting research with college students. Since students are not yet actively considering
particular jobs with particular values, more abstract concerns (such as religion) could form the basis of their planning. Stark (1963) compared a sample of 2,842 graduate students from 25 universities to U.S. census data. A mere three percent of the U.S. population claimed to have no religious affiliation, as opposed to 26% of American graduate students. The National Opinion Research Center asked approximately 35,000 students who graduated from a stratified-cluster sample of 135 American colleges and universities in 1961 to fill out questionnaires; working with a ten percent representative subsample, Greeley (1963) investigated the relationship between religion and career plans. He discovered that Protestants were more likely to choose education as a career field than were Catholics and Jews (34% versus 26% and 27%); Catholics were more likely to enter business than Jews and Protestants (23% versus 17% and 15%); and Jews were more likely to enter law than Protestants and Catholics (10% versus 2% and 3%). As for college majors, students in different undergraduate specialties have been found to vary with respect to how much they value religion ($F = 2.41, p < .05$); art and music education students scored highest ($M = 37.74, SD = 10.90$) on the religious value scale of the AVLSV (Allport et al., 1970), and mechanical engineering students scored lowest ($M = 30.90, SD = 10.53$) (Laudeman & Griffeth, 1978).

Additional research illustrates the possibility that college experiences can influence religion. In 1992, Myers (1996) interviewed the adult children of married couples who had participated in a study in 1980. Myers assessed the participants’ religiousness by asking about how much their religious beliefs influenced their daily lives and how frequently they read the Bible, prayed, and attended church. A weak but significant positive relationship emerged between religiousness and being in college ($\beta = .083, p < .05$). Such a finding may hint at the
impact of college on religiousness, but, being correlational in nature, it cannot firmly establish a causal link.

Hoge, Johnson, and Luidens (1993) conducted a telephone survey of 33- to 42-year-olds who had been confirmed in the Presbyterian Church (USA) during the 1960s. Using multiple regression, they found significant negative relationships between level of formal education and Christian core beliefs (affirming the Bible, belief in Christ, belief in life after death; $\beta = -.13$), Christian particularism (“absolute Truth is found only in Christ and only Christians can be saved”; $\beta = -.24$) and conservative morality (opposing premarital sex, homosexuality, and abortion; $\beta = -.27$), even after controlling for counter-cultural experiences such as participating in protests, attending rock concerts, and smoking marijuana. Moreover, majoring in the humanities or social sciences as opposed to other disciplines was significantly negatively associated with Christian core beliefs ($\beta = -.15$) and Christian particularism ($\beta = -.16$). As with Myers’ study (1996), this study is correlational; while it may be that attending college and majoring in certain disciplines affect personal religiousness, it is equally possible that religiousness affects educational attainment and college major.

The studies by Myers (1996) and Hoge et al. (1993) do not provide direct evidence for religious socialization in college. Even so, they leave open the possibility that education shapes personal religiousness.

Religious Embeddedness and Spiritual Struggle

In addition to the three religious stances described earlier (i.e., irreligiousness, normative religiousness, and humanistic religiousness), other religious factors could be related to the decision to study psychology. One such factor is the degree to which the individual is embedded in a religious framework. Pargament (1997) proposed that in order for a person to make use of
religious resources, religion must be both available and compelling to that person. Participating in religious behaviors and interacting with religious acquaintances makes religious emotions and meaning systems available to people, increasing the probability that they will turn to religion for support. If psychology and religion offer competing ways of understanding the universe and guidance for living, the availability of one could interfere with the desirability of the other as an orienting framework. In other words, praying, reading sacred texts, attending religious services, and being exposed to religion through parents and friends may render psychology a less compelling option. To demonstrate how embeddedness relates to other religious variables, I will briefly review pertinent research.

Parental influence on offspring religiousness is widely assumed in the literature, and there is substantial evidence supporting this connection. Although children tend to be less religious than their parents (Acock & Bengtson, 1978; Hoge, Petrillo, & Smith, 1982), many studies have demonstrated that factors such as parents’ desire for their children to be religious (Flor & Knap, 2001; Acock & Bengtson); parents’ religious beliefs and behaviors (Myers, 1996; Hayes & Pittelkow, 1993; Acock & Bengtson); parent-child religious discussions (Okagaki & Bevis, 1999; Hayes & Pittelkow; Flor & Knap); and parental agreement on religion (Okagaki & Bevis; Myers) are predictive of offspring religious belief and behavior. It must be noted, however, that other research suggests that parental influence is weaker than might be expected (Erickson, 1992), especially when controlling for factors such as religious denomination and socioeconomic status (Hoge et al., 1982). As children grow up, parental variables seem to decrease in predictive power (Ozorak, 1989; Hoge et al., 1993).

Individuals’ religious trajectories are related not only to their parents’ religiousness and influence, but also to their own religiousness during youth. Wilson and Sherkat (1994) found that
those who held religious beliefs and engaged in religious activities as adolescents were less likely to stop attending church in adulthood. In addition, youths who claimed to be highly religious tended to report increasing in religiousness over time; among these same participants, a propensity for contemplating existential questions was associated with greater orthodoxy and personal religious activity (Ozorak, 1989). Religious behavior in the home, such as prayer and Bible reading, is yet another predictor of adolescent religious belief and commitment (Erickson, 1992). On the other hand, it is possible that current belief (instead of past religiousness) causes religious involvement and that experiences during youth diminish in influence over time (Hoge et al., 1993).

Given that exposure to and participation in religion are linked to religious belief and the field of psychology is inimical to religion (or at least particular forms of it), religious embeddedness (defined as participation in religious activities and association with other religious individuals) should be inversely related to the likelihood of majoring in psychology. This relationship may be direct if religious worldviews in general compete with psychology in explaining and prescribing human behavior. Yet it is possible that embeddedness interacts with type of religiousness to affect attitudes toward psychology. Being embedded may augment the attraction to psychology for those with a humanistic religious outlook, while at the same time decreasing the likelihood that the normatively religious will study psychology.

Spiritual struggle may come in the form of doubts about religious tenets, conflict with co-religionists, or feelings of alienation or anger toward the divine (Pargament, 1997). Regardless of one’s convictions, spiritual struggle by its nature undermines religiousness, at least temporarily. In general, religious doubt predicts the wholesale rejection of religion instead of switching to a different religion (Gauthier, Christopher, Walter, Mourad, & Marek, 2006; Hunsberger, Pratt, &
Pancer, 2002). For those who are in need of an optimistic, coherent worldview and who experience struggles with their religion, psychology may be a welcome source of support. In addition, if psychology promotes religious values contrary to an individual’s original values, that individual may experience spiritual struggle as a consequence of exposure to psychology.

Numerous factors can trigger religious doubt. According to a study by Kooistra and Pargament (1999), adverse life events, desire for personal autonomy, conflict with parents, and the perception of parental religious insincerity all contributed to doubt for high school students; this was particularly true for students for whom religion was a central aspect of life. A lack of parental emphasis on religion during childhood predicts religious doubt for young adults (Hunsberger et al., 2002). Doubters consider themselves less religious, attend church less frequently, and receive lower scores on a scale of religious fundamentalism (Gauthier et al., 2006; Hunsberger et al.). Both college students who report growing more religious and growing less religious have a tendency to ponder existential questions (Ozorak, 1989). Doubters who are less religious to begin with are more likely to consult sources that oppose religious belief, which further increases doubt (Hunsberger et al.).

If doubt is negatively related to religiousness, spiritual struggle may moderate the relationship between religiousness and psychology. Although normatively religious students may generally tend to avoid majoring in psychology due to their religious beliefs, spiritual struggle may weaken those beliefs and decrease such students’ aversion to psychology. In contrast, the attraction that humanistically religious students may feel toward psychology could be tempered by struggle with the beliefs that make psychology appealing to them in the first place.
Hypotheses

I have presented evidence that psychologists and the U.S. population are often in disagreement when it comes to religion. My description of values particular to psychology and how those values developed offers a plausible explanation for the religious stances I believe to be prevalent among psychologists. Moreover, the career selection literature demonstrates that person-career value congruence is an important factor when choosing an occupation or even a college major. I therefore suspected that personal religiousness influences the decision to major in psychology, drawing some students to the field while repelling others. Finally, I have suggested that surrounding oneself with religious influences and experiencing spiritual struggle may also have implications for choice of major.

In this study, I compared psychology majors in their junior year with all other juniors combined. Non-psychology majors could presumably have beliefs, values, and experiences that resemble those of the larger U.S. population, so religious differences found between psychologists and the public in previous studies should be replicated in this study. Although this design does not permit conclusions regarding whether either selective attraction or socialization is at work, the results of both processes should, theoretically, be the same.

I also compared psychology majors with students in specific categories of majors. For instance, natural science majors were selected for comparison to see if psychology majors’ standings on religious variables are unique or are simply general effects of a scientific mindset. If psychology and humanities majors are similar on religious variables, the similarities may be related to studying the human condition. Contrasting religion and theology students with psychology students could yield two intriguing outcomes. Dissimilarity would support the contention that psychology and religion are opposed to each other. Similarity would suggest that
psychology has a quasi-religious quality and/or that religion has a psychological component. Finally, previous research has indicated differences between students in vocational majors and students of the liberal arts and sciences (Goyette & Mullen, 2006). To address this possibility, I also compared psychology majors to students in business, education, engineering, and health professions. The classification system for majors was adapted from the taxonomy developed for the Cooperative Institutional Research Project (J. Lindholm, personal communication, March 17, 2008). For the purposes of the current study, religion and theology majors were separated from other humanities majors. (See Appendix A for a list of the majors included in each category.)

I put forth the following hypotheses:

1. Scientism is associated with an increased likelihood of majoring in psychology.
2. Self-fulfillment values are associated with an increased likelihood of majoring in psychology.
3. Irreligiousness is associated with an increased likelihood of majoring in psychology.
4. Humanistic religiousness is associated with an increased likelihood of majoring in psychology.
5. Normative religiousness is associated with a decreased likelihood of majoring in psychology.
6. Religious embeddedness is associated with a decreased likelihood of majoring in psychology.
7. Spiritual struggle is associated with an increased likelihood of majoring in psychology.
8. Religious embeddedness interacts with humanistic religiousness in the prediction of whether students will major in psychology. For those who are highly humanistically religious, the likelihood of majoring in psychology increases as embeddedness increases.
For those who are low on humanistic religiousness, the likelihood of majoring in psychology decreases as embeddedness increases.

9. Religious embeddedness interacts with normative religiousness in the prediction of whether students will major in psychology. For those who are highly normatively religious, the likelihood of majoring in psychology decreases as embeddedness increases. For those who are low on normative religiousness, the likelihood of majoring in psychology increases as embeddedness increases.

10. Spiritual struggle interacts with normative religiousness such that struggling religious normatives are more likely to major in psychology than non-struggling normatives, while struggling and non-struggling religious humanists are equally likely to major in psychology.
METHOD

Sample and Procedure

The data for this study came from two surveys developed and administered by the Higher Education Research Institute (HERI) at the University of California, Los Angeles. Since 1966, institutions of higher education across the United States have been participating in the Cooperative Institutional Research Program (CIRP) Freshman Survey (see Bryant & Astin, 2007, and Szelenýi, Bryant, & Lindholm, 2005). This four-page, 224-item survey collects information about the sociodemographic characteristics of incoming first-year students, as well as many other variables related to the experience of starting college. In 2000, 434 institutions administered the CIRP questionnaire to samples of students that were selected so as to yield a nationally representative composite sample.

As part of the Spirituality in Higher Education project conducted by UCLA, the HERI constructed a four-page, 234-item survey investigating the spiritual, religious, and existential aspects of college students’ lives (see Bryant & Astin, 2007, and Szelenýi et al., 2005). Called the College Students’ Beliefs and Values (CSBV) Survey, it underwent pilot testing in 2003. The HERI contacted numerous colleges and universities, 47 of which agreed to take part in the study. For each institution, 250 students who had completed the 2000 CIRP study as freshmen and had remained at the same institution were sent the CSBV. The survey was presented to the students as a follow-up to the 2000 CIRP study, with the purpose of helping the researchers “gain a better understanding of [the participants’] personal beliefs and values.”

One institution had such a low response rate that its respondents were not used in the analyses. Of the 12,030 surveys mailed, 11,547 were actually delivered; 3,680 surveys were returned with usable data and were used in the current study. Participating institutions varied
widely. Sizable numbers of both four-year colleges and universities (institutions awarding a certain number of earned doctoral degrees) were included in the sample. Likewise, the sample contained public, private nonsectarian, and religious institutions. They represented broad ranges of selectivity and size.

The sample was composed of 1,211 males (32.9%), 2,461 females (66.9%), and eight individuals who did not report their gender (0.2%). Of the participants, 87.1% described themselves as White/Caucasian, 4.8% as Black/African American, 1.6% as American Indian, 4.1% as Asian American/Asian, 2.0% as Mexican American/Chicano, 0.5% as Puerto Rican, 1.4% as Other Latino, and 2.5% as Other race. The median age was 18 years, and 97.5% of the sample was either 18 or 19 years old. The median parental income was between $60,000 and $74,999. The median and modal education level for participants’ fathers and mothers was completion of college.

Religiousness, as assessed by multiple items, was relatively prevalent in this sample. Two thirds of students rated their level of religiousness/religiosity as average or higher than average. Seventy-seven percent described themselves as having an average or higher level of spirituality. One third reported frequently attending a religious service, and another third reported occasional attendance. More than two thirds reported praying at least once a week, and more than one third claimed to read religious texts at least once a week.

Measures

The items on the two questionnaires were created by the HERI with the intention of tapping a broad range of spiritual and religious variables that would then be factor analyzed to demonstrate the interrelationships of the items and to create reliable scales. Factor analyses performed by the HERI identified constructs that are similar to, but distinct from, the constructs
to be assessed in the current study. I searched the surveys for items that could reasonably reflect the constructs in question. The reliability and validity of many of the items were not established prior to this study because they were developed by the HERI, which posed some problems when I attempted to create scales. Additionally, the items came in a variety of formats (e.g., dichotomous, three-point, four-point). Because the items differed in terms of scale, they were converted into z-scores. Composite variables such as the irreligiousness scale were formed by averaging the z-scores of the items. Reliability and principal component analyses were performed for the scales. Because none of the scales were found to be multidimensional, no factor rotation was used. (See Appendix B for the items included in each scale.)

Scientism. Scientism, a faith in science as the only valid explanatory framework for reality, was assessed by three items. Two items ask for the respondent’s level of agreement with statements about the nature of science. Responses are in a four-point Likert format (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly). For example, the statement, “In the future, science will be able to explain everything,” is an endorsement of scientism. Agreement with the position that, “while science can provide important information about the physical world, only religion can truly explain existence,” is reverse coded. The third item presents four possible relationships between science and religion and requires participants to select the one with which they most agree; the statement, “Conflict; I consider myself to be on the side of science,” is an endorsement of scientism. This scale had a coefficient $\alpha$ of .64. Each of the three items was essential to the scale and could not be rejected without significantly reducing its reliability. A principal components analysis was deemed unnecessary due to the low number of items.
Irreligiousness. Ten items make up the irreligiousness scale. Five items assess the respondent’s personal agreement with statements about the sacred and the supernatural on a four-point Likert scale (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly).

“Believing in supernatural phenomena is foolish,” is an example of an irreligious sentiment. Agreement with the statement, “We are all spiritual beings,” is reverse coded. Three other items ask about how well certain statements describe the respondent’s approach to the supernatural on a three-point Likert scale (1 = Not at all, 2 = To some extent, 3 = To a great extent). “Believing in life after death” and “feeling a sense of connection with God/Higher Power” are reverse coded. Finally, respondents rate themselves in comparison with the average person their age in terms of religiousness and spirituality on a five-point Likert scale (1 = Lowest 10%, 2 = Below Average, 3 = Average, 4 = Above Average, 5 = Highest 10%). These items are reverse coded. With a coefficient $\alpha$ of 0.88, the irreligiousness scale proved to be quite reliable. None of the items significantly reduced the scale’s reliability, so they were all retained. Factor analysis of the scale indicated that the first component accounted for 49.5% of the variance, and the Scree plot pointed to a single factor as the best solution.

Normative Religiousness. The normative religiousness scale has eight items that assess the beliefs that God is a transcendent ruler and humans must conform to God’s laws. One item asks respondents to describe God’s relationship to them by marking personally relevant statements and leaving irrelevant ones blank; relating to God as “Master” is the normative relationship to God. Respondents rate their agreement (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly) with two other statements affirming that people who do not believe in God will be punished and that some religions contain more truth than others. Three items assessing agreement (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly) with
statements that religiousness is not necessary for morality and spirituality are reverse coded. Another question pertains to the participant’s ultimate spiritual quest; selecting the option “to know what God requires of me” indicates a normative orientation. The final item asks the participant to rate the personal importance of “following faithfully the Laws and Rules taught by [his/her] religion” on a four-point Likert scale (1 = Not important, 2 = Somewhat important, 3 = Very important, 4 = Essential). The normative religiousness scale had a coefficient α of .82. Factor analysis revealed that its first component explained 44.8% of the variance in the scale. The Scree plot showed a significant drop in the variance explained by subsequent factors, so a single factor solution was used.

Humanism. The originally proposed humanistic religiousness and self-fulfillment scales had low reliabilities (α = .08 and α = .35, respectively) and poor factor structures. Subsequent analysis of correlations between items from both scales revealed a subset of three items that formed a more adequate scale. The items tapped belief in the goodness of all people, feeling a connection with all humanity, and self-rated importance of attaining inner harmony. The first and second items asked the participant to rate how well the provided descriptions described him/her on a three-point Likert scale (1 = Not at all, 2 = To some extent, 3 = To a great extent), whereas the third item was on a four-point Likert scale (1 = Not important, 2 = Somewhat important, 3 = Very important, 4 = Essential). Because these items suggest a positive view of human nature and self but make no explicit references to the sacred, I termed this scale “humanism.” This scale had a coefficient α of .57. A principal components analysis was not performed because the scale consists of only three items.

Religious Embeddedness. Specific behaviors are the primary focus of the religious embeddedness construct. Embeddedness refers to engaging in religious activities and being in
relationships with others who are religious. The scale consists of twelve items with a wide variety of formats. For example, there are questions about joining a religious organization, attending church or other religious/spiritual classes, praying, reading sacred texts, and having close religious friends. Appendix B contains a complete list of the items and their formats. The Scree plot for the irreligiousness scale supported a single factor (the first component explained 48.9% of the variance), and the scale had a coefficient $\alpha$ of .90. Deleting any of the items would have reduced the scale’s reliability.

Spiritual Struggle. Spiritual struggle involves thoughts and feelings that reflect questions, doubts, and strain with God and religion. I measured spiritual struggle with five items used by Bryant and Astin (2007). Two questions prompt respondents to rate how well a given statement concerning struggle (e.g., “feeling unsettled about spiritual and religious matters”) describes them on a four-point Likert scale (1 = Not at all, 2 = To some extent, 3 = To a great extent). The remaining three items inquire about how frequently the respondents experience struggles on a three-point Likert scale (1 = Not at all, 2 = Occasionally, 3 = Frequently). An $\alpha$ coefficient of .68 was obtained for the spiritual struggle scale. Removing any of the items would have decreased the scale’s reliability. Its first component explained 44.1% of the variance; the Scree plot suggested a single factor solution.
RESULTS

The organization of the results section reflects the order in which the analyses were conducted. I first address the distributions of the variables and the handling of missing values. The second subsection describes the identification of outliers and tests of assumptions. Correlations between the scales and covariates are outlined in the third subsection. Hypothesis testing is broken into two parts: the first consists of the six analyses of the primary hypotheses, and the second focuses on analyses of hypothesized interactions.

Score Distributions

Statistical tests of normality revealed significant departures from normality for all of the outcome variables. However, this is to be expected with large sample sizes (Tabachnik & Fidell, 2001), and MANCOVA is typically robust to violations of normality (J. Hahn, personal communication, March 25, 2008). Visual inspection of frequency histograms for the six scales revealed that scientism exhibited the most marked positive skew. The distributions of normativism and irreligiousness also appeared positively skewed. To correct for nonnormality, a natural logarithmic transformation was employed. There were no substantial differences between the results found using transformed and original values, so only results from analyses using the original values are reported.

Listwise deletion of missing values reduced the sample size to 2845, a 22.7% decrease. To counteract this loss of data, the six scales were recalculated such that each case was permitted to be missing one value per scale. For example, the normative scale has eight items. If a subject was missing a value for one of those items, the normative score was calculated by averaging the remaining values; the omission of any single item did not reduce any scale’s reliability to an unacceptable level. In this manner, scale scores were obtained for the normative religiousness
scale for 149 participants, for the humanism scale for 62 participants, for the scientism scale for 55 participants, for the irreligiousness scale for 150 participants, for the religious embeddedness scale for 81 participants, and for the spiritual struggle scale for 68 participants. There did not appear to be a disproportionate amount of missing values among psychology majors, nor among students in the seven other comparison majors. Remaining missing values were replaced with the series means for the appropriate variable. For the six scales, a total of 327 (1.5% of all values) missing values were replaced with a series mean. Missing values for the covariates and additional single-item measures were handled similarly. There were 65 cases in which the student’s major was missing.

Outliers and Tests of Assumptions

Tabachnik and Fidell (2001) noted that, in large samples, one should expect to discover cases that are far from the mean. They therefore suggested using a z-score of 3.3 (α < .001) as a cutoff for outliers. A total of 631 (17.1% of the cases) univariate outliers were thus identified. However, inspection of the outliers suggested that they were not separated from the rest of the distributions of their respective variables, and none of the outliers were farther than 3.5 standard deviations from the mean. Considering the fact that most of the items involved were in the form of Likert scales, it is likely that these “outliers” are legitimate, though uncommon, scores. Further, the low prevalence of racial minorities resulted in many minority students being identified as outliers. For these reasons, it was decided to retain univariate outliers.

To detect multivariate outliers, 19 variables were regressed on subject identification number, and studentized deleted residuals and Cook’s D were calculated for each case. The critical value for studentized deleted residuals was 3.3. Von Eye and Schuster (1998) proposed that cases with Cook’s D greater than .50 divided by p (where p is the number of parameters to
be estimated) are multivariate outliers. Since there were 19 variables, the critical Cook’s D was .026. According to these standards, there were no multivariate outliers. Therefore, the only cases excluded from analysis were those for which major was unknown, resulting in a final sample size of 3635.

None of the tolerances for the variables was lower than .30, so multicollinearity and singularity are unlikely to present a problem for analysis. Visual inspection of the bivariate scatterplots did not suggest serious departures from bivariate normality.

Scale, Item, and Covariate Bivariate Correlations

Four of the scales were moderately or strongly correlated with each other (see Appendix C for correlation coefficients). Irreligiousness and scientism were positively correlated, as were normative religiousness and religious embeddedness. The following were negatively correlated: scientism and normative religiousness; scientism and religious embeddedness; normative religiousness and irreligiousness; and irreligiousness and religious embeddedness. Humanism was weakly positively correlated with religious embeddedness and spiritual struggle and weakly negatively correlated with scientism, irreligiousness, and normative religiousness. Spiritual struggle was not significantly correlated with scientism or religious embeddedness, but was weakly negatively correlated with normative religiousness and weakly positively correlated with irreligiousness. All reported correlations were significant at $p < .01$, with the exception of the correlation between irreligiousness and spiritual struggle, which was significant at $p < .05$.

Analyses

Six primary analyses were carried out. The first MANCOVA was performed with major (psychology versus all other majors) as the predictor variable and scientism, normative religiousness, irreligiousness, and religious embeddedness as dependent variables. MANCOVA
works best when the dependent variables are moderately correlated; since both humanism and spiritual struggle were either weakly or not significantly correlated with the other four scales, both scales were excluded from this analysis. Therefore, I conducted two ANCOVAs in which spiritual struggle and humanism were the dependent variable.

For all three analyses, participant gender, age, race, parental income, and paternal and maternal education level were entered as covariates. Participant race was broken into eight dummy-coded variables: White/Caucasian, Black/African American, American Indian, Asian American/Asian, Mexican American/Chicano, Puerto Rican, Other Latino, and Other. The statistics reported are from analyses including all covariates.

Four other analyses were conducted contrasting psychology majors with students in the natural sciences, the humanities, religious/theological studies, business, education, engineering, and health professions. The first analysis was a MANCOVA predicting scientism, normative religiousness, and religious embeddedness from major. The second analysis was a hierarchical linear regression predicting irreligiousness from major. The third and fourth analyses were ANCOVAs predicting spiritual struggle and humanism from major.

To control the Type I error rate across the seven analyses described, the Bonferroni correction was used. Hence, the multivariate test for any given analysis had to be significant at $p < .007$.

Four additional analyses tested for interactions between humanism and religious embeddedness, normative religiousness and religious embeddedness, humanism and spiritual struggle, and normative religiousness and spiritual struggle using hierarchical linear regression.

Psychology versus Non-psychology Majors. For the first MANCOVA comparing psychology majors to all other majors on scientism, normative religiousness, irreligiousness, and
religious embeddedness, Box’s test indicated that the observed covariance matrices of the
dependent variables were equal across groups (Box’s M = 27.26, p = .003). (Note: The α level
was set to .001 due to the extreme sensitivity of Box’s test; J. Hahn, personal communication,
March 25, 2008). The following covariates were significantly related to the outcomes: gender,
\( F(4, 3617) = 8.67, p < .001 \); age, \( F(4, 3617) = 3.70, p = .005 \); parental income, \( F(4, 3617) = 
6.30, p < .001 \); paternal education, \( F(4, 3617) = 12.18, p < .001 \); Asian American/Asian status,
\( F(4, 3617) = 4.22, p = .002 \); Mexican American/Chicano status, \( F(4, 3617) = 6.41, p < .001 \); and
Puerto Rican status \( F(4, 3617) = 2.70, p < .029 \). After controlling for the covariates, major was
not significantly related to the dependent variables (Wilks’ \( \lambda = .999, F(4, 3617) = .77, p = .54 \)).
(See Table 1 for mean scores, \( F \)-statistics, and \( \eta^2 \).)

The second analysis was an ANCOVA with spiritual struggle as the dependent variable.
Levene’s test of equality of error variances was not significant, \( F(1, 3633) = 3.73, p = .054 \),
indicating the error variances of the two groups were not different. The only covariates
significantly related to the outcomes were gender, \( F(1, 3620) = 7.76, p = .005 \); and
Black/African American status, \( F(4, 3617) = 4.34, p = .037 \). After controlling for covariates,
majoring in psychology had a significant effect on spiritual struggle, \( F(1) = 10.12, p = .001 \).
Psychology majors scored higher than non-psychology majors on spiritual struggle (Mean
difference = .14, \( p = .001 \)).

The second ANCOVA compared psychology and non-psychology majors in terms of
humanism. Levene’s test indicated that the error variances were equal across groups, \( F(1, 3633) 
= 1.52, p = .218 \). The only significant covariate was gender, \( F(1, 3620) = 84.26, p < .001 \). After
controlling for the covariates, psychology and non-psychology majors’ scores on the humanism
scale were significantly different, \( F(1, 3620) = 12.39, p < .001 \). More specifically, psychology
TABLE 1
Estimated Marginal Mean Scores of Psychology and Non-psychology Majors after Controlling for Covariates

<table>
<thead>
<tr>
<th>Major</th>
<th>Major</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>F(1, 3620)</th>
<th>p</th>
<th>η²</th>
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</tbody>
</table>

*Controlling for participant gender, age, race, parental income, paternal and maternal education level, and race

majors were higher on humanism than non-psychology majors (Mean difference = .17, p < .001).

Psychology versus Seven Majors. For finer-grained comparisons, a MANCOVA was conducted contrasting psychology majors (N = 232) with students in natural sciences (N = 314), humanities (N = 213), theology/religion (N = 49), business (N = 518), education (N = 374), engineering (N = 148), and health professions majors (N = 198). In these analyses, I restricted the sample to students who indicated being in at least one of the eight majors. Major was the predictor variable; scientism, normativism, irreligiousness, and religious embeddedness were the outcome variables, and the covariates in previously described analyses were used in this analysis. Using a hierarchical linear regression to test for the equality of regression coefficients for the
covariates when predicting irreligiousness, it was revealed that the coefficients differed significantly across the eight majors ($\Delta R^2 = .049$, $\Delta F(79, 1946) = 1.307$, $p = .038$). Therefore, the final MANCOVA compared the eight majors on scientism, normative religiousness, and religious embeddedness. The results of the hierarchical linear regression of irreligiousness on major controlling for major-by-covariate interactions are reported separately.

Box’s test indicated that the observed covariance matrices of the dependent variables were not equal across groups (Box’s $M = 147.58$, $p < .001$) for the MANCOVA with scientism, normative religiousness, and religious embeddedness as outcome variables. Levene’s test revealed that the error variances of scientism scores ($F(7, 3028) = 5.49$, $p < .001$) and religious embeddedness scores ($F(7, 3028) = 3.44$, $p = .001$) were not equal across groups. Because MANCOVA assumes equality of covariance matrices and error variances, the results of this analysis must be interpreted with caution.

The following covariates were significantly related to the outcomes: gender, $F(3, 2023) = 6.37$, $p < .001$; parental income, $F(3, 2023) = 5.10$, $p = .002$; paternal education, $F(3, 2023) = 8.78$, $p < .001$; White/Caucasian status, $F(3, 2023) = 2.89$, $p = .034$; Asian American/Asian status, $F(3, 2023) = 3.43$, $p = .016$; and Mexican American/Chicano status, $F(3, 2023) = 4.97$, $p = .002$. After controlling for the covariates, major was significantly related with the outcome variables, Wilks’ $= .91$, $F(21, 5809.51) = 8.78$, $p < .001$, $\eta = .03$. Major had a significant effect for each of the dependent variables individually, with $F$-values ranging from 10.61 to 16.87, and $p$-values all below .001. Pairwise comparisons were conducted comparing psychology majors with each other major. Psychology majors differed from theology/religion majors on all three outcome variables: the former were higher on scientism (Mean difference $= .45$, $p = .004$), and lower on normative religiousness (Mean difference $= -.37$, $p = .007$) and religious embeddedness
(Mean difference = -.81, \( p < .001 \)). Psychology majors were higher than education majors on scientism (Mean difference = .22, \( p = .012 \)), lower on normative religiousness (Mean difference = -.30, \( p < .001 \)), and lower on religious embeddedness (Mean difference = -.22, \( p = .003 \)). None of the comparisons between psychology majors and the other five majors was significant. (See Table 2 for mean scores, \( F \)-statistics, \( \eta^2 \), and significant pairwise comparisons).

Considering all pairwise comparisons (using the Bonferroni correction) of the estimated marginal means for each major puts the results in perspective. Theology/religion majors and education majors were significantly lower than all (or most) other majors on scientism. Business majors were lower on scientism than students in the natural sciences. Education majors were higher than all other majors, except for theology/religion majors, on normative religiousness and religious embeddedness. Theology/religion majors scored higher than all other majors on religious embeddedness and were significantly higher on normative religiousness than students in the natural sciences, engineering, humanities, and psychology. Business majors were higher on normative religiousness than students in the natural sciences. In summary, it appears that although psychology majors differed from theology/religion and education majors on all three scales, they were not very different from students in the other five majors on these scales.

The hierarchical regression predicting irreligiousness from major indicated a significant effect for major (\( \Delta R^2 = .011, \Delta F(7, 2025) = 3.28, p = .002 \)). However, after controlling for all possible interactions between each major and each covariate, none of the regression coefficients for the individual majors was significant. Controlling only for significant interactions, majoring in education showed a significant negative effect on irreligiousness (standardized \( \beta = -.39, t = -2.75, p = .006 \)).

Psychology majors were contrasted with the other seven majors on the spiritual struggle
# Table 2
Estimated Marginal Mean Scores of Students in Eight Different College Majors after Controlling for Covariates

<table>
<thead>
<tr>
<th>Major</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>F(7, 2025)</th>
<th>p</th>
<th>$\Delta \eta^2$</th>
<th>Significant pairwise comparisons</th>
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*a* Controlling for participant gender, age, race, parental income, paternal and maternal education level, and race.
scale by means of an ANCOVA. Levene’s test of equality of error variance suggested the error variances for the eight groups were equal, $F(7, 2038) = 1.60, p = .131$. The only significant covariates were gender, $F(1, 2025) = 4.08, p = .044$; and Black/African American status, $F(1, 2025) = 7.27, p = .007$. Controlling for the covariates, major had a significant effect on spiritual struggle, $F(7, 2025) = 7.69, p < .001$. Pairwise comparisons (using the Bonferroni correction) indicated that psychology majors were significantly higher on spiritual struggle than business majors (Mean difference = .26, $p < .001$), education majors (Mean difference = .22, $p = .001$), and engineering majors (Mean difference = .31, $p < .001$). Interestingly, humanities majors were also significantly higher on spiritual struggle than business, education, and engineering majors, and the magnitudes of the mean differences were similar to those reported for psychology majors.

A final ANCOVA was conducted comparing psychology majors to the seven other majors in terms of humanism. According to Levene’s test, the error variances were equal across groups, $F(7, 2038) = .85, p = .55$. The only significant covariate was gender, $F(1, 2025) = 39.61, p < .001$. After controlling for the covariates, major was significantly related to humanism, $F(7) = 3.23, p = .002$. Pairwise comparisons (using the Bonferroni correction) revealed that psychology majors were higher on humanism than students in the natural sciences (Mean difference = .21, $p = .025$), business (Mean difference = .23, $p = .002$), education (Mean difference = .22, $p = .006$), engineering (Mean difference = .25, $p = .042$), and health professions (Mean difference = .23, $p = .015$).

Interaction Analyses. Two hypotheses predicted interactions of religious embeddedness with humanistic religiousness and normative religiousness. Two additional hypotheses predicted interactions of spiritual struggle with humanistic religiousness and normative religiousness. To
test these hypotheses, I performed four hierarchical linear regressions predicting majoring in psychology versus not majoring in psychology. However, because the originally proposed humanistic religiousness scale was not reliable, I tested for interactions with the humanism scale instead.

The covariates from previously described analyses were entered in the first step for each regression. For the first analysis, religious embeddedness and humanism were entered in the second step. The third step tested whether the interaction term (humanism multiplied by religious embeddedness) explained a significant proportion of variance over and above that explained by the additive variables. The change in $R^2$ was not significant ($\Delta R^2 = .000$, $\Delta F(1, 3618) = .44$, $p = .51$), indicating that there was no interaction between embeddedness and humanism. A similar process was carried out for the remaining tests for interactions between religious embeddedness and normative religiousness ($\Delta R^2 = .000$, $\Delta F(1, 3618) = .039$, $p = .84$); struggle and humanism ($\Delta R^2 = .000$, $\Delta F(1, 3618) = 1.58$, $p = .21$); and struggle and normative religiousness ($\Delta R^2 = .000$, $\Delta F(1, 3618) = .068$, $p = .79$). In no case was the change in $R^2$ significant, so none of the interaction hypotheses was supported.
DISCUSSION

The aim of this study was to determine whether the differences between psychologists and non-psychologists in terms of values and religious characteristics (especially psychologists’ lower levels of traditional religiousness) also set junior-year psychology majors apart from students in other majors. When compared to all other students, psychology majors did not differ in terms of scientism, normative religiousness, irreligiousness, or religious embeddedness. However, psychology majors did report greater levels of spiritual struggle and humanism. Subsequent analyses investigated potential differences between psychology and other classes of majors. Psychology majors were higher in scientism and lower in normative religiousness and religious embeddedness than theology/religion and education majors. Both psychology and humanities majors were higher in spiritual struggle than business, education, and engineering majors. Finally, psychology majors were higher on humanism than students in the natural sciences, business, education, engineering, and health professions.

Psychology versus All Non-psychology Majors

Similarities

The data did not support the hypotheses predicting differences between psychology majors and all other students with respect to scientism, normative religiousness, irreligiousness, and religious embeddedness. Therefore, psychology majors may not differ from other majors with respect to these particular values and religious characteristics. The process of selective attraction may not have been strong enough to separate students who truly hold beliefs consistent with psychology from those who do not. Any college student can choose to major in psychology, and this major has become very popular (National Center for Education Statistics, 2008). As a result, people may enter the major for reasons extrinsic to the nature of psychology itself, such as
its lack of heavy math course requirements, having friends who are psychology majors, or a
genial interest in people rather than a commitment to the psychological worldview. Indeed,
many students may be unaware of the values underlying psychology. If they are familiar with
those values and disagree with them, they may compartmentalize their personal values, viewing
them as independent of the values promoted by their major. In contrast, students who pursue
graduate education and a career in psychology are probably well versed in psychology’s
assumptions and also more in agreement with those assumptions. After all, they are investing
themselves and their futures in the field. Such individuals, however, may form only a small
subset of a heterogeneous group of psychology majors.

Similarly, psychology majors may not have been sufficiently socialized into a
psychological perspective. Undergraduates have been exposed to psychology for a shorter period
of time than have people who are farther along in their career development. Also, undergraduate
socialization in psychology may be weaker than that which occurs in graduate school and the
profession itself. In addition to the study of psychology, students take many other courses and
engage in other activities that may counteract the effects of psychological socialization. Further,
students are still transitioning from dependence on family to independence. Family influences
may prevent students from straying too far from the beliefs with which they were brought up.
Socialization in graduate school and on the job is more intensive; more time and energy are
devoted to cultivating proficiency in psychological knowledge and skills, and the subjective
sense of commitment to psychology may be greater. At this stage of life, individuals probably
have less contact with family and have fewer ties binding them to the beliefs their family holds.

To summarize, the undergraduate years may simply be too early in the educational
process for certain religious differences between psychologists and non-psychologists to become
evident. Different results might emerge through comparisons of graduate students in psychology with graduate students in other fields. This conclusion is consistent with the research by Schneider et al. (1998) that found management-level subjects in an organization to exhibit personality homogeneity. The managers may have been subjected to attraction and socialization processes more strongly or for longer periods of time, resulting in a common personality type consistent with the values of the organization. Likewise, Becker and Connor (2005) found that older managers were more similar in terms of values than were younger managers. While Laudeman and Griffeth (1978) discovered that undergraduates in different majors valued religion to varying degrees, the differences were small; moreover, their sample was composed of seniors nearing the end of their studies, so the students may have been more committed to the values of their future careers than the junior-level students in the current study. Hoge et al. (1993) did find that majoring in the social sciences predicted lower levels of Christian particularism, which is a normative religious belief, later in life. However, intervening variables such as whether the participants actually entered careers related to social science could explain this relationship.

*Spiritual Struggle in Psychology Majors*

The data supported the hypothesis that psychology majors are higher in spiritual struggle than the rest of their peers. This difference could result from selective attraction, socialization, or both. As mentioned earlier, students who are uncertain about or dissatisfied with their religious beliefs or background could be searching for a coherent framework that will help them make sense of their world. Psychology may seem like a promising source of knowledge about oneself and the rest of humanity, as well as a possible cure for human suffering. Pargament and Kooistra (1999) found that a desire for personal autonomy is related to religious doubt, a form of spiritual struggle. Autonomously minded students could be attracted by psychology’s emphasis on self-
determination, and that emphasis may reciprocally increase the desire for autonomy; the outcome of the cycle could be spiritual struggle in more religious students. Alternatively, socialization in psychology may encourage students to question dominant cultural beliefs and values, as suggested by Weller and Nadler (1975). The students whose personal worldviews are challenged may be beset by spiritual struggle. In any case, spiritual struggle in psychology majors could contribute to the development of the religious profile that is common among those who eventually choose psychology as a career. The spiritual strugglers who are leaning toward abandoning their faith or adopting a more humanistic stance may be especially drawn to further education in psychology. The additional socialization in graduate school or the career itself may help to bring the individual into alignment with psychology-sanctioned values and religious stances, such as irreligiousness. Given that religious doubt has been found to lead to apostasy (Gauthier et al., 2006; Hunsberger et al., 2002), the spiritual struggle among psychology majors may be a precursor to the reduced religiousness of career psychologists.

**Humanism in Psychology Majors**

I originally planned to evaluate psychology majors’ levels of self-fulfillment values and humanistic religiousness. Unfortunately, the items did not combine to form reliable scales and too few participants endorsed the dichotomous humanistic religiousness items, so these items were not included in the analyses. Hence, a secular scale of humanism was developed, one that asked about feeling connected with all humanity, believing in the goodness of all people, and valuing attaining inner harmony. Endorsing these views does not necessarily indicate a humanistic religious stance because the items make no specific reference to the sacred. Even so, the items in the humanism scale are consistent with a humanistic religious stance. Feeling a connection with all humanity and believing in the goodness of all people suggest a positive view
of human nature, which is certainly more characteristic of humanistic religiousness than of normative religiousness. Yet it may only reflect the ability of the psychologist-to-be to empathize with others. The third item, the pursuit of inner harmony, appears related to a focus on the self and the ability to satisfy the deepest needs within oneself. Whereas normative religiousness would promote calling on a transcendent deity for healing and comfort as the solution to life’s problems, humanistic religiousness would likely promote the individual’s personal power and virtue.

Since psychology majors are not less normatively religious than the rest of the sample but do express higher levels of humanism, it may be that psychology majors do not perceive humanistic and normative religious concepts and attitudes to be in opposition. According to Guimond and Palmer (1996), lower-level social science students may not have integrated political ideologies. Hence, they may agree with two positions that contradict each other. Upper-level students had more internally consistent ideologies in the Guimond and Palmer study. Therefore, with subsequent socialization, psychology students might be more likely to reject normative views in favor of their humanistic counterparts.

Psychology versus Seven Other Majors

Comparing psychology majors to other categories of majors yielded some insights. Psychology majors and students of theology/religion and education were quite different from one another. Theology/religion and education students were lower in scientism, but higher in normative religiousness and religious embeddedness. In other words, these two sets of majors preferred a belief in a particular religious system with a powerful deity that requires obedience to moral laws instead of a materialistic, naturalistic view of the world. In addition, they reported greater involvement in religious activities and more interaction with religious people. It is
important to add that most of the other majors also differed in the same ways from theology/religion and education majors. This implies that it is theology/religion and education majors who are distinctive rather than psychology majors. In fact, the means of the psychology majors were similar to those of business, engineering, health professions, natural sciences, and humanities majors, confirming that psychology majors share the same levels of scientism, normative religiousness, and religious embeddedness with many majors.

Both psychology majors and humanities majors reported greater spiritual struggle than business, education, and engineering majors. The fact that the humanities and psychology study human activities and ways of knowing may account for their similarity in this regard. They require a reflective approach to the human condition that is likely less necessary for more vocationally oriented majors. As such, psychology and the humanities may deal more directly with suffering and other philosophical questions that may exacerbate spiritual struggles. On the other hand, strugglers may seek answers to their questions through studying psychology and the humanities.

Goyette and Mullen (2006) noted differences between students in the arts and sciences and students in vocational majors. They found that higher socioeconomic status, higher academic proficiency, not being concerned having a high income or steady employment, and viewing leisure time as important were associated with majoring in the arts and sciences. The present study suggests that certain arts and sciences majors (i.e., psychology and the humanities) differ from several clusters of vocational majors (i.e., business, education, and engineering) in spiritually salient ways as well. Further, the differences in spiritual struggle cannot be attributed to differences in socioeconomic status because the analysis controlled for parental income and educational attainment.
Last, psychology majors scored higher on humanism than students in the natural sciences, education, engineering, business, and health professions majors. Considering the characteristics of the respective fields, these results are understandable. Psychology devotes attention to the intangible realm of human experience, while the natural sciences generally work with more concrete, impersonal objects and processes. Similarly, the vocational majors typically focus on more practical concerns. Psychologists’ fascination with and intimate knowledge of human nature may predispose them to identify themselves as a part of the human family, to desire to peer inside themselves and attain harmony, and to hope that, deep down, they carry a divine spark. Supporting the notion of psychology majors’ interpersonal orientation, Harton and Lyons (2003) found that self-reported empathic concern and perspective taking predicted majoring in psychology.

Interaction Analyses

The interaction analyses did not support any of the related hypotheses. Hence, neither religious embeddedness nor spiritual struggle moderates the relationship between majoring in psychology and normative religiousness. The same is true for the relationship between majoring in psychology and humanism.

Limitations

Several limitations must be noted. First, the items used to represent certain constructs were not developed with those constructs in mind. Factor analyses conducted by the HERI did not identify clusters of items corresponding to the proposed normative religiousness, humanism, irreligiousness, scientism, and religious embeddedness scales. The validity of the scales in this study has not been tested, so it is possible that the items do not truly represent the theoretical variables.
Second, according to statistical tests and examination of frequency histograms, some of the scales and items were skewed and kurtotic. However, significant skewness and kurtosis statistics may be artifacts of a large sample. Using a natural logarithmic transformation did not alter the results, indicating that skewness might not have significantly impacted analysis.

Third, some assumptions important for conducting MANCOVA were violated in the comparison of the eight majors with respect to scientism, normative religiousness, and religious embeddedness. The covariance matrices and error variances were not equal across groups, so the findings of this analysis may not be completely trustworthy. In particular, the fact that the theology/religion cell was much smaller than the other cells (N = 49) and had the smallest variances on each variable increased the likelihood of finding significant differences between theology/religion majors and others. Even so, inspecting the mean scores for each major revealed that the means for the theology/religion majors were drastically different from those of other majors, so it is still probable that theology/religion majors scored differently on these variables.

Fourth, the data for the primary analyses were cross-sectional. This precludes any inference of causality. Additionally, the data were collected when the students were juniors. Both selective attraction and socialization processes would have had ample opportunity to take effect. Hence, it is impossible to determine the relative roles of each process in producing any of the observed differences between psychology majors and others.

Future Directions

In light of these limitations, certain implications for future research are quite clear. First, measures for each construct should be carefully developed based on theoretical considerations and pilot tested prior to use in a large-scale study. Second, longitudinal research designs are needed in this area. More specifically, by assessing students immediately upon entry to college
their freshman year, the effects of socialization into a major would be controlled, thus permitting a stronger test of the effects of selective attraction into psychology. Students could then be re-assessed several years later. Differences in religious trajectories of psychology and other majors would provide clear evidence that the experience of majoring in psychology alters psychology majors’ religiousness. A longitudinal study of this kind would also permit investigation of whether certain religious predictors measured during freshman year are predictive of becoming a psychology major later, which would further support the selective attraction hypothesis.

Furthermore, it would be most enlightening to follow up with psychology majors to see if there are differences between those who go on to graduate school in psychology and those who do not. A longitudinal study of graduate students would provide similarly useful information. Researchers could compare psychology graduate students to other graduate students as they enter and move through graduate school. As noted earlier, it might not be until graduate school that the effects of selective attraction and socialization really come into force.
References


## Appendix A
### Classification of Majors

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Appendix B
Scale Items

**Scientism**

Please indicate your agreement with the following statements. (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly)

1. In the future, science will be able to explain everything.
2. While science can provide important information about the physical world, only religion can truly explain existence (reverse coded)
3. For me, the relationship between science and religion is one of: (Mark one option only)
   - O Conflict; I consider myself to be on the side of religion.
   - O Conflict; I consider myself to be on the side of science.*
   - O Independence; they refer to different aspects of reality.
   - O Collaboration; each can be used to help validate the other.

*Marking the second option is scored as “1” – all other responses are scored as “0.”

**Irreligiousness**

Please indicate your agreement with the following statements. (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly)

1. Believing in supernatural phenomena is foolish.
2. We are all spiritual beings. (reverse coded)
3. The universe arose by chance.
4. Whether or not there is a Supreme Being is a matter of indifference to me.
5. I have never felt a sense of sacredness.

Indicate the extent to which each of the following describes you (1 = Not at all, 2 = To some extent, 3 = To a great extent)

6. Feeling a sense of connection with God/Higher Power that transcends my personal self (reverse coded)
7. Believing in life after death (reverse coded)
8. Believing only what I can see or can be explained

Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (1 = Lowest 10%, 2 = Below Average, 3 = Average, 4 = Above Average, 5 = Highest 10%)

9. Religiousness/religiosity (reverse coded)
10. Spirituality (reverse coded)

**Humanism**

Please indicate the extent to which each of the following describes you (1 = Not at all, 2 = To some extent, 3 = To a great extent)

1. Feeling a strong connection with all humanity
2. Believing in the goodness of all people

Indicate the importance to you personally of (1 = Not important, 2 = Somewhat important, 3 = Very important, 4 = Essential)

3. Attaining inner harmony

**Normative Religiousness**

1. How do you view God or other Higher Power in relation to yourself? (Dichotomous)
   - O Master

Please indicate your agreement with the following statements. (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly)

2. Some religions convey more truth than others.
3. People who don’t believe in God will be punished.
4. Most people can grow spiritually without being religious. (reverse coded)
5. Non-religious people can lead lives that are just as moral as those of religious believers. (reverse coded)
6. It doesn’t matter what I believe as long as I lead a moral life.

7. The ultimate spiritual quest for me is (Only one option out of several could be selected)
   O To know what God requires of me

Indicate the importance to you personally of (1 = Not important, 2 = Somewhat important, 3 = Very important, 4 = Essential)

8. Following faithfully the Laws and Rules taught by my religion

**Religious Embeddedness**

1. Since entering college, have you (Dichotomous)
   O Joined a religious organization on campus

General activities engaged in during the last year: (1 = Not at all, 2 = Occasionally, 3 = Frequently)

2. Attended a religious service

How often do you engage in the following activities? (1 = Not at all, 2 = Less than monthly, 3 = Monthly, 4 = Once/week, 5 = Several times/week, 6 = Daily)

3. Prayer
4. Meditation
5. Religious singing/chanting
6. Reading sacred texts
7. Other reading on religion/spirituality

Since entering college, please indicate how often you have: (1 = Not at all, 2 = Occasionally, 3 = Frequently)

8. Spent time with people who share your religious views
9. Attended a class/workshop or retreat on matters related to religion/spirituality

How many of your close friends (1 = None, 2 = Some, 3 = Most, 4 = All)

10. Belong to a campus religious organization
11. Go to church/temple/other house of worship

Please indicate your agreement with the each of the following statements. (1 = Disagree strongly, 2 = Disagree, 3 = Agree, 4 = Agree strongly)

12. I know someone I can turn to for spiritual guidance.

**Spiritual Struggle**

Indicate the extent to which each of the following describes you (1 = Not at all, 2 = To some extent, 3 = To a great extent)

1. Feeling unsettled about spiritual and religious matters
2. Feeling disillusioned with my religious upbringing

Since entering college, please indicate how often you have: (1 = Not at all, 2 = Occasionally, 3 = Frequently)

1. Felt angry with God
2. Struggled to understand evil, suffering, and death
3. Questioned your religious/spiritual beliefs
Appendix C
Correlation Matrix of Scales and Covariates

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N = 3680
All reported correlations significant at p < .05