

Review

Whither Neurotheology?

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Received: 18 October 2019; Accepted: 12 November 2019; Published: 15 November 2019



Abstract: Human culture has modernized at a much faster pace than has theology and religion. We are at the point where many moderns apparently think that religion is losing relevance. Satisfying the need for relevance and ecumenical harmony requires more reasoned and mature approaches to religion. Science is one of those secular activities that seems to undermine religious faith for many people. Unlike the sciences that give us the Big Bang, relativity, quantum mechanics, and theories of evolution, neuroscience is the one science that applies in everyday life toward developing a faith that promotes nurturing of self and others. Modern neuroscience and the mental health understanding that it creates can contribute to satisfying this need. Neuroscience and religion have numerous shared areas of concern, and each worldview can and should inform and enrich the other. Neuroscience may help us understand why we believe certain religious ideas and not others. It helps to explain our behavior and might even help us live more righteous and fulfilled lives. Religion can show neuroscientists areas of religious debate that scientific research might help resolve. New educational initiatives at all levels (secondary, seminary, and secular college) can provide a way to integrate neuroscience and religion and lead to religious perspectives that are more reasoned, mature, satisfying, and beneficial at both individual and social levels. Neurotheology is an emerging academic discipline that seems to focus on integrating neuroscience and theology. About only 10 years old, neurotheology has not yet consolidated its definition, ideology, purpose, or scholarly or applied strategies. Acceptance by the scholarly community is problematic. This manuscript raises the question of whether neurotheology will survive as a viable discipline and, if so, what form that could take.

Keywords: neuroscience; religion; theology; neurotheology

1. Introduction

This review of the emerging discipline of neurotheology aims to explain what the discipline is currently about and how it might evolve more maturity and usefulness. In so doing, this paper presents a worldview of everyday living that integrates neuroscience, mental health, and religion.

Scientific discoveries are often seen to conflict with certain religious beliefs that originated thousands of years before the advent of modern science. Scientific data on the age and nature of the universe and the theory of evolution are glaring sources of conflict between science and religion, and they present an unnecessary barrier to reconciliation. Believers sometimes feel conflicted about making a choice between incompatible positions of the two worldviews. Scientists are wedded to evidence, and may dismiss religion when doctrines conflict with the evidence of science. A primary reason for the tenuous relationship between science and religion is that, as neuroscientist Paul Nunez puts it, “We must remind the faithful of how much we know, and the scientists of how little we know” (Nunez 2010, p. 37).

For many scientists, evolution precludes religious belief, because they think it eliminates the need for a creator God. In the provocative book, *Science vs. Religion*, (Ecklund 2010), the author cites survey results showing that 34% of university scientists say that they “do not believe in God,” compared to only 2% of the general U.S. public. Another 30% of scientists say, “I do not know if there is a

God, and there is no way to find out,” compared with only 4% of the general public. In other words, the claim of being atheist or agnostic is made by 64% of scientists, compared to only 6% of the general public. Not surprisingly, students tell me that science professors generally avoid the topic of religion or mention it dismissively in their classrooms.

In addition to collating survey data, Ecklund surveyed 1700 scientists at 12 unnamed elite universities, supplemented by one-on-one interviews of 275 of them. She found a great reluctance to incorporate religion into university curricula. True, professors may talk about religion, but only to disparage creationism.

The survey did find a handful of so-called “boundary pioneers,” scientists who were willing to step across the separation boundary that blocks discussion of religion in the classroom. I am one of those boundary pioneers, unknown to Ecklund at the time, but I am the only one, as far as I know, who thinks that the argument between creation and evolution is the wrong issue. The science that matters is the science of brain function, neuroscience. Spiritual realities may be “out there,” all around and even within us, but we need a brain to perceive and make sense of any part of them. Neuroscientists are likely to argue that the brain generates spiritual possibilities, mediates religious experiences, and creates religious beliefs. If we understand how the brain works, we have a better insight into the ways the brain constructs religious ideas. This understanding empowers us to develop a more reasoned and mature religion.

People of faith tend to accept doctrine rather than search for supporting evidence. People of science tend to put boundaries around the areas, like religion, where truth can be found. Scientists may regard supernatural phenomena as illegitimate topics. But science has its own kind of mysticism of inexplicable things, such as worm holes, quantum entanglement and tunneling, dark matter, dark energy, and parallel universes. Yet, scientists do know that there are realities they do not understand. For practical purposes, such things might as well be considered supernatural—at least temporarily.

Despite the evident tensions between science and religion, there are hopeful signs. Some physicists, for example, see in modern physics a complexity and majesty that is hard to explain as random accidents of nature. The practice of medicine has long accommodated religion to help some patients cope with their illnesses, and more use of religion in modern medicine has been advocated (Singh and Shaunak 2012). Though some psychologists consider religion to be an illusion, large numbers of Christian-based psychological counseling centers are in successful operation. The position advocated in this paper is that such counseling would be enriched by more incorporation of neuroscience.

I should point out that Neurotheology is not always interpreted in a way that supports religion. For example, Matthew Alper used a Socratic approach to argue that our thoughts about spirit and God come from brain function. This conclusion was interpreted as an argument for atheism. That is, God does not exist, but rather we believe in God because we have a genetic trait that makes our brain believe in spiritual realities (Alper 2001).

There is one science, neuroscience, where science and religion can meet on common ground with many shared interests and values. Neuroscience is the study of the brain and nervous system that integrates all underlying biology (anatomy, physiology, biochemistry, psychology, clinical neurology, and others). Practitioners generally share a similar background and scholarly vocabulary in biomedical sciences. They use complementary research strategies and methods, and have congenial attitudes toward those who work in the other underlying biology specialties. Conclusions from research in the various specialties are generally accepted if they are published after peer review has certified that the research met generally accepted standards of scientific practice.

The brain is key to happiness, thinking, and health (Leaf 2013), and I maintain that it is key to a reasoned and mature religious faith. Until the last few years, participants in the science-religion debate have ignored neuroscience. Yet, the discoveries from neuroscience enlighten us about how our minds think, form beliefs, and behave in all aspects of life. Neuroscience can and should help us all lead more fulfilling and happy lives that are compatible with sound spiritual values.

Both neuroscience and religion are inextricably tied to a concept of the human mind. Some people seem to think of mind as some kind of ethereal immaterial substance. However, as you can find in any modern neuroscience textbook, neuroscientists have uncovered overwhelming evidence that the human mind is a biological process that comes from the brain (LeDoux and Hirst 1986; Kosslyn and Koenig 1992; Sternberg 1999). Consider the evidence that mental function changes:

- As the brain develops in infants and children.
- With the brain's physiological state (coma → anesthesia → sleep → dreaming → wakefulness → consciousness).
- From drugs that act on the brain.
- In response to education provided to the brain.
- In response to electrical or magnetic stimulation of the brain.
- In response to trauma or disease of the brain.

Knowing all this, how can anyone claim that mind is some kind of ghost that does not come from the brain? Neuroscience cannot explain the soul, but it does show that mind and soul are not likely synonyms. Religious neuroscientists likely believe that mind and soul are intertwined, but they cannot be identical.

We use our minds to form and control our thoughts, beliefs, and behavior. Neuroscientists assert that mind is not some outside-the-body ghostly force. It is brain activity that can control and program its own activity. This foundational claim may be key to understanding how mind generates spiritual thought and experience and to how the feedback serves to program the kind of mind the brain generates in the future. Experience, including spiritual experience, programs the brain by its own thought. That programming causes observable physical changes in the brain's synaptic anatomy and biochemistry.

"Mind over matter" exists because mind IS matter. Neuroscience has established that mind is a bioelectric process. The currency of all thinking, including religious thinking, is minted in the collective existence of temporal and spatial patterns of nerve impulses flowing in a global workspace network of sub-networks (Klemm 2011). I can summarize how neuroscientists, including many religious neuroscientists, view the "mind" as follows:

- Brain: tissue-based mind.
- Mind: the messaging represented by impulse patterns within brain tissue.
- Message (thought): meaning contained in the representations of experience and thought carried by nerve impulse patterns.

When I wrote about this in a blog post, a critic posted the snarky comment, "So, the mind is just nerve impulses flowing around in the brain?" The obvious rebuttal would be: "Try thinking without nerve impulses!"

The human brain can choose and mediate spiritual experiences. That does not mean there is no God, no soul, or even that some spiritual experiences may be externally mediated. It does mean that through conscious brain functions, we can choose to seek understanding of God and to nurture our brain and soul in righteous living. Unlike the science that gives us theories of evolution, the Big Bang, relativity, and quantum mechanics, neuroscience is the one science that applies in everyday life toward developing a faith that promotes nurturing of self and others.

The brain's construction of ideas about God can emerge from reasoning about the natural world. This is the basis of so-called "natural theology." However, throughout human history, there is clear evidence that ideas about God emerge from spiritual experiences. A Pew research poll revealed that there is a 50% chance that a given person has had at least one spiritual encounter (Hagerty 2009). Whatever their origin, such spiritual encounters are inevitably scenarios that occur inside a conscious brain.

2. Disciplinary Hybridization

Scientific disciplines historically have been prone to split into specialty areas that fuse with other disciplines to form new scientific hybrid disciplines. One of the earliest hybrid births might have occurred with chemistry, which, early in its history, partnered with biology to birth biochemistry and later, chemical engineering. Both new disciplines have obviously prospered.

Neuroscience is prone to spin off sub-disciplines. Neuroscience has already spawned such disciplines as social neuroscience, philosophical neuroscience, neuro-education, and others. In all such spawns from a parent discipline, some offspring may prove to be banal. This may be the case with neuroscience's partnership with theology. This partnership is relatively too new for reliable prediction of its future.

One of the earliest attempts to integrate neuroscience and religion is found in the studies by the neuroscientist and Zen practitioner James Austin (Austin 1999). He reported EEG indicators that brain activity is reduced during meditation-induced deep relaxed breathing. He reported that Transcendental Meditation may have different effects from open-eyed Zen meditation. Simple relaxation can be as effective as meditation. Such findings anticipate the later brain imaging studies showing that different brain areas activate depending on what aspect of religious experience one happens to be experiencing.

At the same time, the book, *Mystical Mind*, appeared as the first definitive evidence that the brain creates religious experience such as mythmaking, ritual and liturgy, meditation, near-death experiences, and theology itself (d'Aquili and Newberg 1999). The authors went further to suggest future implications for philosophy, science, and theology. Yet, to date, these implications await realization, as this present paper indicates.

This was followed in 2002 by a book confirming brain function in the human propensity for religion (Newberg et al. 2002). The authors described studies of meditating Buddhists and Franciscan nuns at prayer which revealed that certain brain areas become specifically activated when Buddhists have the perception of "oneness with the universe" or the Franciscans sense the presence of God. The inescapable conclusion is that humans are hardwired for mystical transcendent thinking that inevitably leads to an experience of God.

This was the early era of widespread use of magnetic resonance imaging, which led to further discoveries of fascinating correlations between religious thoughts and experiences and corresponding activation of specific brain regions (Newberg 2010, 2018). An explicit advocacy for employing social, cognitive, and affective neuroscience to the understanding of religion was made by (McNamara 2009).

A large body of neurotheology literature is accumulating, as evident in the bibliographies in the papers in this Special Edition on Neurotheology. However, not all scholarly disciplines are amenable to hybridization, and this has not yet been demonstrated for neuroscience and religion. This new hybrid is open to disparagement on several grounds. One problem is that not everyone agrees on the definition. Just what is Neurotheology? Another problem is in agreeing on what purpose neurotheology serves. Perhaps most intractable is that each worldview contains elements that seem to be incompatible.

To date, the literature has focused on important explorations on identifying brain areas that are active during religious experience. However, to grow and evolve, neurotheology needs to move beyond "God spots" in the brain to issues of everyday relevance. This *Religions'* special issue on neurotheology aims to show some of the ways in which neurotheology can get beyond "God spots." This present paper in the Series addresses the viability of this new hybrid discipline and explores how neuroscience and religion can be complementary and mutually informative.

Nonetheless, it is not certain that neurotheology will ever gain the status and relevance needed to survive as a viable new scholarly discipline. Among the problems are the following:

- **Many scholars in both partnering areas are hostile to their partnering discipline.** As far as I know, there are no surveys of the religiosity of neuroscientists, but the Ecklund surveys of a mixture of scientists mentioned above revealed that 64% of them are near equally divided into either atheist or agnostic camps. Such scientists are prone to dismiss religious people as ignorant

and superstitious. Incompatibilities arise from theologians because they typically have little exposure to science in college, still less in neuroscience, and may regard science as an enemy. When faced with the evidence of science, some people of faith respond with fear and trepidation: fear that people of weak faith may abandon the faith and trepidation that some of the holy beliefs in which they have invested existential emotion may need adjustment. Few, if any, are eager to have neuroscientists suggest that some beliefs now held to be immutably sacred might benefit from rethinking in light of research evidence.

- **It is not clear what each partner brings to the marriage of disciplines.** What does religion have to contribute to neuroscience, and vice versa? This present analysis will suggest some possibilities, but certainly, there has been little exploration of this issue.
- **Both fields have quite different histories and experience with spawning scholarly hybrids.**

While religions have been around for thousands of years, neuroscience is a 20th century invention. Ever since Pavlov's work on conditioning around 1900, assorted scientists have performed research on the nervous system, but no formal concept of neuroscience congealed until 500 scientists, which included this author, banded as charter members to create the Society for Neuroscience (SN) in 1969. Today, SN has about 37,000 members worldwide. Before that time, most scientists who would later identify as neuroscientists worked in assorted areas of biomedical science. Physiologists working on the nervous system became "neurophysiologists". Anatomists became "neuroanatomists". Pharmacologists became "neuropharmacologists". And so on. These and other related specialties shared common philosophies, knowledge bases, research objectives, and heuristics. Neuroscience was a convenient and natural unifier.

Religions do not have this kind of heritage. They have spawned many brands of religion and even some mergers, but the driving force typically is conflict among competing brands. Moreover, religion is not a science. A marriage of neuroscience and religion will create strange bedfellows.

3. Failure to Understand and Embrace the Need for New Perspectives

Few religions have made much of an attempt to incorporate the God of the Big Bang, the God of "spooky physics," the God of evolution, the God of biological forces and processes, or the God of neuroscience. Indeed, some religious people think science is the enemy of God, without acknowledging that the God of their religion is also the God of science. This vacuum in religion creates fertile ground for token religiosity or even atheism by people who are educated in the sciences.

Certain religious doctrines have offended those who know and value science. The so-called conflict between science and religion typically arises from a fixation on a few lines of text about creation in Genesis I and II. Why so many religious people make this a centerpiece of religion is baffling. Surely, religion has much more important messages to convey. What should matter infinitely more are matters that affect one's life—and afterlife!

There are many people of faith and scientists who prefer to focus on the issue of the conflict between creationism and evolution. This focus has appeal to both groups: (1) it can be debated in the abstract without demanding much personal introspection or change, and (2) choosing a side in the debate provides the opportunity to embrace and advocate for something larger than oneself. Ever since 1859 when Charles Darwin and his "bulldog" Thomas Huxley ushered the theory of evolution into public debate, science has been progressively challenging ancient religious doctrines.

People today can tend to think of science and religion with one or more of three propositions:

- (1) Both science and religious faith are valid for adherents, but cognitively dissonant,
- (2) Science lures people away from religion to become agnostics or atheists,
- (3) Science might prove to be a new source of religious revelation.

Of the three possibilities, the most common may be proposition number two. The world, at least the developed world, seems to be drifting away from religion in large part because of science and

technology. Nonetheless, science reveals the magnificence of God's creation and is a source of discoveries that can help us have lives that are more wholesome.

Human need influences thought and behavior. In first-world countries, most people have their physical needs satisfied because of the affluence in their economy and government welfare programs that sustain those in poverty. This is particularly evident in socialist countries, which are conspicuously less religious.

The Pew Research Center projects major shifts in religious affiliation around the world that could cause a turbulent future. Demographic data project that adherents to Islam will grow by 70% to around 3 billion in 2060 (Pew Research Center 2014). Christians are dying faster than new ones are being born.

Numerous surveys reveal that in the U.S., major declines of membership are occurring in mainstream Protestant denominations. One poll showed that in 2003, 50% of Americans identified with Protestant faith, but by 2017, the number has dropped to 36% (DeJong 2018).

There is also a major shift toward atheism and agnosticism among young people. The breakdown of those identifying as atheists or agnostics is as follows:

Young millennials: 36%

Older millennials: 34%

Generation X: 23%

Baby boomers: 17%

Silent generation: 11%

Neuroscience is the academic discipline that can help people recognize and resolve cognitive, emotional, and spiritual needs they may not know they had. The institutions of religion often teach that belief and faith in God bring emotional peace and comfort. Many people in first-world countries do not feel compelling needs to be comforted or helped by God, except, of course, when some tragedy occurs in their life. Yet, widespread family breakdown, identity politics and the politics of personal destruction, the frequency of suicide, growing drug abuse, mass abortions, mass shootings, and wars and rumors of wars provide clear evidence that not all is so well.

One need that all people have is to be happy and emotionally fulfilled. Spiritual leaders generally fail to enlist the findings of neuroscience in their ministry to help people live fulfilled and spiritual lives. If they knew more about neuroscience, they could be more effective in counseling.

Spiritual beliefs can provide comfort in times of trouble or illness. I find it somewhat odd that religions readily sponsor hospitals that fix broken bodies but seem to have little interest in mental-health clinics that fix broken minds. Everybody has mental health issues of some kind at some time in their life. Stress, anxiety, and depression are universal.

There are some steps being taken to advance the dialogue between neuroscience and religion. One such book covers spirituality in the practice of psychiatry, *Spirituality and Psychiatry* (Cook et al. 2009). This is an academic book aimed at treatment of mental disease. This book reinforces my contention about an intimate relationship between mental health and religion.

In addition, ten years ago, a foundational book (McNamara 2009) presented a clear initial account yet of the underlying neural circuits and chemistry that are bound with religious experiences. Of special relevance was coverage of such topics as the neuroscience of selfhood and the neuroscience involved in religious language and ritual.

The most recent book is *Neurotheology* (Newberg 2018), an extension of his earlier book mostly about brain scans during religious experience. The new book defines, explains, and largely establishes the emerging field of Neurotheology. The book reviews the evolution of religion, the abnormal psychology of religion, and the neuroscience of myths, rituals, and mystical experiences. A main purpose is to inform the public that a new academic discipline is emerging that integrates neuroscience and religion. Newberg says, "Neurotheology is far too broad to be described in any one book." My new book introduces an integration of neuroscience, mental health, and religion: *Triune Brain, Triune Mind, Triune Worldview* (Klemm 2019). The aim is to extend neurotheology to matters of everyday

living and to show how these three worldviews can be synergistic in helping people live happier and more fulfilled lives.

4. Neuroscience and Existential Angst

In 2018, a different kind of book announced the birth of a supposed emerging social-science discipline: *Neuroexistentialism* (Caruso and Flanagan 2018). Traditional existential philosophy seems to hold that human life inevitably engenders angst over issues of morality, meaning and purpose of life, and personal fulfillment, especially because there is no God to provide these things. The positions that this book hold about neuroexistentialism include the following:

- Religion only creates an illusion of meaning and purpose.
- If humans are to find meaning and purpose, each person must construct it.
- Only neuroscience can moderate the angst caused by a realization that the cosmos has no inherent meaning or purpose.
- Angst magnifies with the common existential belief that humans have no free-will capacity to chart a course for finding meaning and purpose.

Neuroscience supposedly provides such course charting, but how that would work without free will to implement its principles is not clear. On the contrary, neuroscience is the source of the angst of believing we have no free will. However, I have found multiple conceptual and experimental reports that debunk the neuroscience research that has led to the conclusion of illusory free will (Klemm 2017a). To those reports, I have since found three more that support free will (Moore 2012; Nachev and Hacker 2015; Shurger and Uithol 2015).

Even without free will, traditional existentialists insist that we still must make choices in how to be and how to live. These choices are the yardsticks by which we measure our sense of success, happiness, and fulfillment as conscious agents. Some existentialists, especially Sartre, argue that we do have free will to make such choices. With free will, the idea that we are the source of such choices is terrorizing, because believing that we have such freedom requires us to hold ourselves accountable for the choices.

Neuroexistentialists seem to insist that humans are just smart animals lacking spiritual properties. However, humans are more than smart animals. Cognitive neuroscientists have uncovered two mental capabilities that seem unique to humans: (1) scenario simulation in a mental theatre, and (2) deliberate practice. The neuroexistentialist position does not explain why we imagine simulated scenarios that lead to religions. If we were only smart animals, we would not have created religions. Humans imagine transcendent thought that generates various scenarios about God, creation, and God–human interactions. Associated with such scenarios is the desire to refine and perfect it, which humans have pursued for millennia in the deliberate practice of doctrinal development in various religions.

In life sciences, the foundational theory of biological evolution has little power to provide a convincing natural-selection reason for humans to have the mental capacity for generating scenarios about God. Social order and laws do not require religion, as Godless communist countries demonstrate. In fact, because humans have widely conflicting religious scenarios, religious incompatibilities have subjected the species to innumerable wars and devastation. That actually seems biologically maladaptive.

I think that religion evolved at least in part to address the existential angst over meaning and purpose of life. Now, however, neuroexistentialists hold that we no longer need religion. Thus, we are left to rely on neuroscience to provide remedies for existential angst. Neuroscience, in this view, becomes our God, substituting for the imagined God of religions that we should not have been believing in all along.

I do not see neuroscience as a defense or mental salve for atheism. However, the fact that neuroexistentialists see neuroscience as valuable for their purpose constitutes support for my contention that neuroscience can be more appropriately applied to enriching a religious life.

I see neuroscience as an essential component of a triune worldview that includes mental health and religion. If neuroscience helps us to make adaptive choices on being and living, how much more so can it support those same objectives of religion? Rather than a substitute for religion, neuroscience could become its ally. In fulfillment of Augustine's vision of a necessary role for reason in religion, neuroscience can help us think through such matters as morality, love and other emotions, self-hood, autonomy, consciousness, free will, and the means for living a righteous life of meaning and purpose. The existential power of neuroscience magnifies when integrated into mental health and religion.

5. The Religion–Neuroscience Interface

5.1. Neurotheology

Neurotheology is the recognition of a relationship between neuroscience and religion (Sayadmansour 2014; Newberg 2018). The neurotheology pioneers are best known for brain-scan studies of people during their religious experiences. The strategy was to perform scans before and during certain mental religious experiences, such as praying. Different areas of brain become activated depending on the specifics of a given religious experience.

The brain functions that generate ideas about right and wrong, ethics, and morals may not be exclusively committed to religious belief and practice. Secular humanists, whose numbers include many neuroscientists, may believe in morals and a wholesome lifestyle, but not in a God. The closest that humanists get to that is Buddhism, which does not require God, and promotes morals not so much because of what they do for social justice and harmony but for what they do for personal inner peace.

Informing religion, from any source, is problematic. The reason we have so many religions (currently said to be over 4000) is that believers make different decisions on what information they wish to accept into their belief system, often without much knowledge, introspection, and assessment. Many of us “window shop” for a church home until we find one with doctrines that are most compatible with our pre-existing beliefs. The findings of neuroscience are seldom if ever considered. Nor do we have good ways to assure that we are mentally healthy. Thus, each religious group has agreed to accept only certain bits of information as religiously valid, leading to major disparities among religions and their denominational sub-groups.

5.2. Shared Areas of Concern

Neuroscience and mental health aim to show how we humans can be better people, more honorable, more devoted to helping others, more fulfilled, and more capable in our quest to not only “have life but to have life more abundantly.”

Beyond basic enlightenment, there are many practical reasons to link neuroscience and religion, because they have the shared goals of helping people. Some examples of shared interest and value include the desire to help people:

- Know and value the nature of creation and life.
- Respect for the body and brain.
- Adopt lifestyles that promote health of both body and brain.
- Learn and grow in understanding of others and ourselves.
- Know the basis for human agency and self-control.
- Program the brain for mentally healthy thinking and emotions.
- Overcome personal weakness and limitations.
- Minimize stress, mental anguish, anxiety, despair, and depression.
- Nurture oneself and others.
- Promote mental calm, rest, and rejuvenation.
- Prevent and cure maladaptive ideas, emotions, beliefs, compulsions, and addictions.
- Heal broken minds and spirit.

- Live healthy, fulfilled, and happy lives.

5.3. A Triune Worldview

Understanding the brain reveals that religious ideas and practices arise from fundamental human nature, which includes emotion, reason, and beliefs. Religious ideas are also shaped by the social and cultural context within which they evolve, as exemplified by the divergences between middle Eastern religions and Asiatic religions. Understanding the brain can help to explain the diverging and contradictory views of various belief systems. Neuroscience can illuminate how humans generate the various dimensions of the sense of self, and our beliefs, attitudes, biases, decisions, conclusions, habits, and behaviors associated with our religions. To perform these functions properly and effectively depends on mental health.

In short, I contend that modern religion needs what I call a triune worldview, one that recognizes and accommodates the overlap of neuroscience, mental health, and religion (Figure 1).



Figure 1. A triune worldview. Interrelationships among neuroscience, religion, and mental health. Together, they can be the basis for a life of fulfillment and joy. From (Klemm 2019).

My current understandings grew out of five semesters of my Neuroscience and Religion course at Texas A&M (Klemm 2017b), where upper-division biomedical science students and I researched the peer-reviewed literature with the aim of discerning useful knowledge on how neuroscience and religion might inter-relate. This was a stimulating educational challenge for me as well as the students. Neuroscientific research rarely considers religion, and theology journals rarely consider neuroscience. This pedagogical experience revealed to students that both religion and neuroscience can help us become more mentally healthy and have more enlightened perspectives about human spirituality.

5.4. How Neuroscience Can Contribute to Religion

While there is no scientific understanding of soul, most religions hold that it somehow connects to human mind. One working assumption is that what we think and believe in our mind sculpts the righteousness of the soul or corrodes it. Mind is the province of neuroscience. Religion needs to incorporate this understanding, as I explain in more detail in my *Triune* book.

Extending Neurotheology. Neurotheology is primed to go deeper than the pioneering research to involve mental health, re-evaluate religious doctrines, and stimulate research into certain theological issues. I hope to see an application of neuroscience to a more reasoned and mature religious faith, hopefully one that is more inclusive than the current fractured world of organized religion. For example, religious communities that shun or even kill people of other faiths would benefit from knowing what neuroscience reveals about the corrosive personal effects of isolation, alienation, and hate.

From an everyday, practical perspective, neuroscience relates most obviously to religion in the sense that the brain's mind sets the religious and moral standards that guide our beliefs and lifestyle and the various ways that we practice religion. The relationship is reciprocal: our brain determines

what we believe and how we act, and our beliefs and actions program our brain for how it should respond in the future. Neuroscience tells us how to be mentally healthy, and that can inform and be informed by religious beliefs and practice. Neuroscience reinforces the duties and “thou shalt nots” of religion by explaining the why and how to live out religious doctrine. Even in secular situations, we have all experienced how much easier it is to change our thinking and behavior if we know why we need such change and how to make the break from past perspectives and habits. Righteous living generally benefits the believer and those affected by the believer.

The unexamined life is not worth living—Socrates

Addressing the Unexamined Life. Only the brain can conduct the life examination urged by Socrates. Neuroscience provides new ways to fulfill the edict of Jesus, “Seek and ye shall find.” Neuroscience can illuminate how humans cultivate their sense of self, beliefs, attitudes, feelings, biases, knowledge, understandings, decisions, conclusions, habits, and behaviors. Neuroscience brings rigor to religious introspection, helping to explain how our thoughts, beliefs, and behavior change who we are, even at the deepest level of brain anatomy and physiology. We learn what is mentally healthy from neuroscience, and healthy minds seek sound religious experience and doctrine. This seeking, in turn, nurtures one’s mental health, happiness, and personal fulfillment in the service to others. Neuroscience can enrich our understanding of the roadmap by which we travel on life’s journey of self-examination, personal growth and, yes, even religious beliefs.

Neuroscience and mental health might help the agnostic and atheist to recognize the narrowness and shallowness of their understanding. Secular humanists argue that natural selection explains everything. They deviously seem to accept the implication of Biblical literalists that God waved some kind of wand, and Adam and Eve appeared. This creates a strawman argument that science can readily demolish. Secular humanists miss the experiences provided by religion for beauty, consolation, power, wisdom, and personal fulfillment. By failing to take religion seriously, they miss the opportunity to see past the apparent obstacles of evolution and cosmology.

People of faith might discover that some beliefs and practices are essential, while others should be optional, and others need revision in the light of clear scientific evidence. Such understanding could promote ecumenical harmony as well as accommodating the discoveries about how the natural world actually works. Such understanding can help us develop more tolerance for people in other faith traditions, realizing that what really matters is finding the true God, not how that is accomplished. Religions should be perfected, not mired in past misinformation.

In a world filled with uncertainty, pessimism, cynicism, failure, despair, defeat, anxiety, fear, depression, lies and all manner of deception, animosity, and hypocrisy, neuroscience provides an array of educational, emotional, psychological, and behavioral tools that would be more effective if used in a religious and spiritual context. Neuroscience shows us ways to cast out the demons of the Catholic “seven deadly sins” and their consequences in daily living. Neuroscientists would empower the mission of helping people find fulfillment by accepting religion, despite its rigidities and irrationalities, as a potential partner that can provide the spiritual dimension of life that humans inherently seek and need. For their part, religious believers would benefit from regarding neuroscience, despite its necessary obsession with materialism and reason, as a potential partner in the goal of improving human life.

Reason and Religion. I asked myself many years ago, “Why don’t people talk about reason’s role in religious thinking?” At the time, I did not know about the classic quote of Augustine some 1600 years ago, “I believe so that I may understand. I understand so that I may believe.” Such an outlook speaks to today’s neuroscientists and religious believers.

Religions require certain beliefs and behaviors, some of which are in harmony with what is known about the brain and some that are not. Evidence and reason should undergird religious beliefs; otherwise, beliefs may be challenged as fantasy or fairy tales. Neuroscience provides important factual knowledge that is necessary for sound reasoning.

We must look to neuroscience for a mature and reasoned understanding of perceptions and beliefs. The facts and understanding revealed by neuroscience help humans compensate for their limited introspective capacity. The point is that most of us are not spiritual connoisseurs but have rather limited introspective ability about our beliefs. However, a sophisticated understanding of anything is something we can learn, just as musicians or wine tasters learn perceptual capabilities the rest of us do not have. This prompts my concern over the paucity and dismissiveness of religious education in public schools and universities. This is why I see a need for college-level instruction on how religion and neuroscience inform each other. That is why I created such a course at Texas A&M.

The brain can grow in mental capacity by learning and reason. No one is born a scientist, but many people can learn how to think like one. Reasoning improves a scientist's competence. I contend that it can also improve religious competence, however we choose to define that.

Mission. The mission programs of religion could receive very practical benefit from the knowledge and understanding provided by neuroscience. Below is a list of mission areas where I think neuroscience can be of great help.

- Religious teaching (methods and content)
- Spiritual reasoning and decision making
- Mental health
- Family relationships
- Child development
- Transgenerational inheritance
- The nature of tribalism, peer pressure
- The effects of personal space
- Mindfulness, meditation
- Sense of self
- Self control
- Emotional functions

5.5. How Mental Health Can Contribute to Religion

Much of human mental suffering, according to the ancient Buddha, arises from the mind's attachment to itself and to the world. A similar teaching comes from the teaching of Christ to be "in this world, but not of this world." Throughout history, people have looked to religion to find relief from their stress, fear, anxiety, despair, and the other emotional traumas that life imposes. Now that mental health is a neuroscience-based medical discipline, we need to examine how to apply it to religion. A growing body of research demonstrates a link between mental health and religiosity. Religious ideas and practices can surely advance as understanding and treatment of mental illness develop. At the opposite pole, certain religious beliefs and practices may arise from mentally unhealthy origins. Some religious doctrines actually contribute to learned helplessness, a sense of unworthiness, depression, anxiety, obsessiveness, and in the extreme, suicidal terrorism.

A common religious doctrine urges believers to seek a healthy lifestyle. Christian scripture regards the body as the "temple of the soul." Neuroscience provides documentable advice on how to be healthy. A brain's health clearly affects one's ability to deal with the uncertainties, ambiguities, and conflicts of life. Religious views and practices are determined by such mental factors as the ability to situate one's sense of self socially and in relation to a perception of God, to reason clearly, and to practice faith, hope, and love. Such tasks are difficult to achieve without neuroscience and mental health knowledge. We express our religiosity by our social relations with others, and our ability to reason, and control of our emotional states. These tasks become infinitely harder, perhaps impossible, when real mental diseases create obstacles for religious beliefs and practices to be well informed, emotionally valid, intelligently reasoned, and successfully implemented.

Mental diseases affect the way we think and can lead to behaviors that are antithetical to religion, such as suicide and antisocial acts involving violence, murder, and war. Paradoxically, the antisocial mental dysfunctions are often exhibited in the name of religion, wherein killing people of the “wrong” religion is not only permissible but also actually considered by zealots as a holy duty.

5.6. How Religion Can Contribute to Neuroscience and Mental Health

The essence of all religion is belief, and those belief requirements are more challenging when the objects of belief lack compelling evidence. Why do some people hold certain beliefs that others reject? Neuroscience and mental health are the obvious arenas to look for such understanding, but so far, this issue is neglected in both worldviews. “Belief Neuroscience” is in its infancy. Belief is a general property of brain function, and not surprisingly, persuasive arguments have been advanced that religious beliefs are affected by mental biology (Lipton 2011; Bering 2011).

We need to learn more about how past experiences, secular and religious, train the brain to respond to experiences in spiritual ways and determine the emotional and cognitive processes by which the brain comes to believe what it accepts as valid. Clearly, people differ enormously in this regard. Even animal research could be relevant, as animals also have many beliefs, though unlikely to be religious ones.

Religious beliefs and practice can actually improve mental health, being demonstrably helpful in preventing and alleviating stress, anxiety, substance abuse, pain, depression, and suicidal behavior. Religion provides meaning and purpose to life as nothing else can. The full benefit of religion is limited by the fact that high rates of atheism exist among mental-health professionals. A nationwide 2003 survey about the religion of 1144 U.S. physicians from many specialties, including 100 psychiatrists, revealed that the psychiatrists were the most secular (Curlin et al. 2007). I write a blog for *Psychology Today*, and the editors have explicitly told me I must not include comments favorable to religion, as they are a strictly secular journal. Atheism prevents mental health professionals from harnessing patient religiosity to promote diagnosis, healing, and recovery (Whitley 2017).

Religion can benefit neuroscience and mental health by identifying religious issues needing more biological understanding, such as abortion, sexual identity, ritual and religious practices, moral sense, decision-making, self-control, self-help, meditation and prayer, guilt and shame, and sinful behavior.

Some other specific examples where religion could drive research include:

- **Poorly Understood Behaviors.** These behaviors include self-control, stereotyped thinking, compulsions and addiction, faith healing, hallucinations, fetal sentience, dream interpretation, free will, homosexuality, transgenderism, narcissism, fanaticism, asceticism.
- **Moral Behavior.** New knowledge could lead to better preventives and treatment of undesired behaviors such as greed, sloth, gluttony, envy, pride, cults, and religious terrorism. Perhaps we could find ways to help people engage in such religiously desirable behaviors as empathy, charity, forgiveness, and repentance.
- **Spiritual Counseling.** Though some therapists include religious perspectives in their treatments, it seems likely that efforts to improve mental health would surely benefit from the values and comfort that religion can provide. Specific counseling activities that could benefit include substance abuse, addiction, anger management, obsessions, anxiety, fear, depression, learned helplessness, PTSD, dream interpretation, and personal actualization. Cognitive behavioral therapy would do well to incorporate religious ideas that comport with a patient’s existing belief system and modify those beliefs where appropriate. Therapeutic approaches that capture positive religious themes might help patients find helpful new and better ways of thinking and behaving.

6. A Fresh Look at Religious Beliefs and Practices

6.1. *Modernism Has Not Modernized Religion*

Of the major religions, Islam is the newest, but it is over 1300 years old. Hindu and Jewish religions originated thousands of years ago. Much has happened over these thousands of years in terms of knowledge, education, culture, and understanding of what makes us human. Is it not high time that we modernize religion and enhance its crucial importance for creating a better life—in *this* world? Sadly, the whole idea of “updating” religion is commonly taboo. It is not just the 10 Commandments that are carved in stone.

The current trend away from religion in the U.S. and Europe seems to have accelerated in recent years. Ancient religions seem out of step with modernity, but that does not prove that people have lost interest in spiritual matters. Maybe it just means they are dissatisfied with the options provided by organized religion.

Modern science propels itself forward at breakneck speed. It may impede or promote spiritual growth, depending on how we incorporate new knowledge into religious belief systems. Little incorporation has occurred. Science is driving people away from religion, as also is changing culture. Religion seems stuck in a distant past, and if it does not adapt, still more people may abandon traditional religion. A pagan world would be terrifying to behold.

6.2. *The Role of Education*

Where will we find leadership for guiding the evolution of neurotheology? One obvious answer is that theologians should lead the way, and seminary curricula could benefit from reform. No modernization of religions can occur without changes in the way theologians are educated. Seminary trainees often come from liberal arts educational programs that required few courses in science. Science majors generally pursue careers in science and technology, not theology. Thus, it is no surprise that people interested in theology do not think much about neuroscience and vice versa.

Seminaries provide fertile ground for education that integrates science and religion. The American Association for the Advancement of Science (AAAS 2018) has created a new curricular initiative in multiple seminaries to broaden the education of future clerics. From what I have seen of their curricula, all the emphasis is on evolution and physical science. Neuroscience and mental health seem conspicuously neglected. Despite my suggestions to AAAS, I see little change.

Another place where we should expect reform is in secular academia. Paradoxically, many of the original universities, such as Oxford and Cambridge, were created with a religious mission. Today, most universities other than seminaries do not embrace religion, but avoid it or relegate religion to small “religious studies” programs.

One of scientists mentioned by Ecklund’s book, a physicist who had no religious identity, offered a defense of religion in the classroom, saying: “Getting students to talk about religion is an important part of their instruction in a university setting. It ought to be something that everybody talks about—personally and even professionally . . . that is our job—to get students to think and evaluate. Religion has to be a part of that—not just their own but other people’s.” This is what we do in my Texas A&M course in Neuroscience and Religion (Klemm 2017b). Sadly, a course like this is not yet replicated in other universities.

Clerics who wish to modernize their theology must have enlightened followers. This may require major changes in the way young people are educated. In public K-12 schools, teaching about religion is frequently banned in the U.S. under the misguided understanding that the Constitutional mandate for “freedom of religion” means “freedom from religion.” Universities do not ban religious instruction, but academic content surely discriminates against the teaching of religious ideas. Yet religion was a major theme in the dialogues and writings of the founders of Western culture, like Socrates, Plato, Aristotle, Cicero, and Augustine. Though formal religious studies programs exist in some universities, the vast majority of college students get no religious education other than dismissive rhetoric in science

and history classes. The other problem is that neuroscientists, even those who are not atheists, do not think much about the connection of their science to religion. Both groups seem discomforted by mixing the two subjects.

Compounding the dismissiveness toward religion is that university science curricula are fragmented into specific disciplines (chemistry, biology, etc.). Science credit-hour requirements leave little room for humanities courses and usually none for religious-studies courses. Some liberal arts colleges do the opposite: pack curricula with humanities courses at the expense of a science education. Science courses typically relate to other science courses in the same discipline, but often receive insufficient integration with other scientific disciplines and still much less to non-science courses. Of the physics professors I know, I am astonished at how little neuroscience they know, and I am certain that they feel the same about how little math and physics I know. Students can graduate knowing how to program computers without knowing how to program their own brain. These students graduate with compartmentalized thinking and lives.

Worse yet, narrow focus in science breeds a hubris of self-sufficiency. Students learn more and more about less and less, without knowing about all the things they do not know. Humility requires understanding the need for introspection about one's own personal spiritual state.

I have found that the college experience influences the religiosity of college students, even students at a secular university. A random survey that we conducted at Texas A&M of 1662 students of nearly equal gender and class standing revealed that our institution seems to affect both religious belief and practice in at least half of the students (Patel et al. 2018). The effects become evident after just the freshman year and are generally sustained until graduation. Over all 4 years, 10 aspects of the university's culture enhanced religious beliefs in 33% of students, and 48% reported increased all five religious practices that we identified. Smaller numbers reported diminished belief (18%) and religious practice (22%). Precollege religiosity was amplified in that believers strengthened their beliefs, and skeptics became more skeptical. The same was true for all practice factors, except discussion with peers, who had a huge influence, even on enhancing religious practices by atheists and agnostics. Finally, regardless of precollege religiousness, active believers and evangelicals were significantly more likely than atheists and agnostics to have enrolled in nontechnical academic majors. Overall, we concluded that the prior college surveys of religiosity are likely flawed because data were pooled from students across multiple, quite diverse colleges. We think that colleges can have unique cultures that may create distinctive effects on student religiosity.

My experiences with students in our "Neuroscience and Religion" college course are that college students have a great deal of angst about science and religion and seem to be starved for understanding of how these worldviews should relate. Most college students bring their shallow childhood religious instruction to their college classes. Neuroscience can help students realize how their biology, conditioning, experiences, culture, education, emotions, and cognitive processes affect their religious views. In turn, religion can provide worldviews that challenge neuroscience and remind us of how much in science remains unknown and may even be unknowable. In my course, students learn how to evaluate peer-reviewed scholarly research in terms of how each worldview can inform the other. Sadly, this educational opportunity is rarely provided anywhere in public universities.

The need to integrate the biology of the brain with spiritual issues seems most necessary with young adults, whose lives often seem in disarray and without the benefits of a rich religious life. In his book, *Does God Make a Difference* (Nord 2010), the author laments the fact that we have taken God out of schools and universities, as if such a subject embarrasses us. He points out, for example, that the biology texts he examined cover empathy and altruism in animals, but fail to mention such behavior in humans. The textbooks he surveyed had no coverage of the issues of determinism vs. free will. Of the 7356 pages in the eight textbooks he examined, less than one page discussed biological influences on religion. No wonder religion might seem irrelevant to college students, professors, and academic administrators.

Nord's book references a 2004 UCLA study of 100,000 entering undergraduates that found 76% of students were searching for a life meaning and purpose. Yet another UCLA study found that over half of the students complained that their professors never allowed for reflections about spirituality or religion. You can see why I created a Texas A&M course in Neuroscience and Religion.

7. Conclusions

This emerging discipline of neurotheology is fraught with enemies on both sides of the divide who threaten to strangle this infant discipline with suffocating disdain, specious argument, and outright attack. If neurotheology is ever to mature, people on both sides will need attitude adjustments. This can only occur when both sides acknowledge the merits of the other, restrain their dismissiveness, and share in addressing areas of common concern.

In that spirit, I have presented an overview of how three prominent worldviews can be mutually informative:

1. Neuroscience can contribute to religion by providing knowledge and understanding to support a more reasoned and mature construction of religious faith. Neuroscience can even provide new tools to support the various missions of organized religion.
2. Mental health can contribute to religion by showing how mental problems influence religious beliefs and practices. Mental health principles can identify mentally unhealthy religious views.
3. Religion can benefit neuroscience and mental health by prompting research into the biology of belief, doctrines and practices that are divisive and in need of better understanding, reduction of undesirable thoughts and behaviors, and promotion of behaviors that benefit the individual and the society.

Humans struggle to find peace and happiness. Historically, various religions have promoted spiritual beliefs and lifestyles that could lead to personal fulfillment and social harmony. Yet, in the modern world, the impact of religion seems to be lessening, as in some countries, people are leaving their religious organizations in droves. In part, the mixed messages of the various conflicting religions tend to fall on deaf ears that yearn to hear one coherent message that will help us deal with this fallen world.

A reasoned, coherent, and mature religious belief system requires healthy minds. Neuroscience provides the understanding and therapeutic tools to promote healthy minds. In turn, religions help identify moral and theological issues that could benefit from a better understanding of brain health and mental function.

Acknowledgments: The author wishes to thank Texas A&M University for its support and administrative flexibility for allowing me to develop these ideas in a new academic course on Neuroscience and Religion for upper-division undergraduates. Thanks are due for the efforts of approximately 100 students over five semesters in exploring relevant academic literature.

Conflicts of Interest: The author declares no conflict of interest.

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