BEYOND WISHFUL THINKING: RECONCILING FAITH AND SCIENCE IN CRISES OF HOPE

by John N. Constantino and W. Thomas Baumel

Abstract. Steady advances in neuroscience have shaped understanding of brain and mind, in ways that challenge spiritual belief and can amplify misconceptions about biological determinism. The inability to reconcile spirituality and science risks faith being construed as "out of touch" with reality, and in worst-case scenarios engendering clinical-level crises of hope. The latter typically involve three central issues: the free will problem, desperate perceptions about mortality, and the constraint of individual identity. Here, we synthesize contemporary scientific and philosophical understanding to propose a reconciliation of faith and science of particular relevance to preservation of hope. In this approach, we review the compatibility of natural causation and human freedom, parameterize "meaning" on the basis of specific opportunities for decision-making within the timeframe of a lifetime, and articulate a model of self-transcendence predicated on these principles and on observed characteristics of human love. This model resides within "common ground" for faith and science by avoiding unnecessary dichotomization of the material and the Divine.

Keywords: compatibilism; determinism; existential conflict; free will; identity; meaning; neuroscience; psychiatry; self-transcendence; theology

Introduction

> The prisoner who had lost faith in the future…was doomed. With his loss of belief in the future, he also lost his spiritual hold; he let himself decline and became subject to mental and physical decay.
>
> —Viktor Frankl, *Man's Search for Meaning* ([1946] 2006, 69)

John N. Constantino is the Blanche F. Ittleson Professor of Psychiatry and Pediatrics at Washington University in St. Louis, where he is also Psychiatrist-in-Chief of St. Louis Children's Hospital, and Director of the William Greenleaf Eliot Division of Child and Adolescent Psychiatry, Washington University School of Medicine, St. Louis, Missouri, USA; e-mail: constantino@wustl.edu. W. Thomas Baumel is a medical student and a research assistant at the Anxiety Disorders Research Program, University of Cincinnati College of Medicine, Cincinnati, Ohio, USA; e-mail: baumelwt@mail.uc.edu.

 ISSN 0591-2385

Existential crises precipitated or aggravated by the collapse of faith-based mental frameworks are common contributors to depressive states (Hacker 1994; Baumel and Constantino 2020; Mosqueiro et al., 2021). These crises can arise from conflicts between assumptions embedded in spiritual formation and the recognition of physical realities that cannot be reconciled with those assumptions. Historically, loss of close loved ones and the prospect of mortality have been two of the classic precipitants of depressive crises, but in recent years widely disseminated advances in science—particularly in the domains of genome, brain, and behavioral sciences—have intensified the burden of reconciling spirituality and science. Direct implications of contemporary models of human consciousness and the predictability of mental phenomena can be misunderstood to imply that spiritual belief is misguided, or that there exist such pronounced biological constraints on individual freedom that it is not possible to live a meaningful life. Either of these perspectives can engender hopelessness, which is a correlate of clinical depression and one of the most potent predictors of suicidal thinking and behavior (Schafer et al., 2020; Tsujii et al., 2020; Gray et al., 2021).

Our purpose in this article is to address the scholarly reconciliation of spirituality and science through a distinct clinical lens, by focusing on elements that are of particular salience to crises of hope. Typically, in scenarios of hopelessness, existential conflicts arising from failure to reconcile faith and science relate to one or more of three major issues: (1) the free will problem, (2) the implications of mortality, and/or (3) the constraint of individual identity. To our knowledge, there are no single-source writings that have covered this constellation of issues in accordance with contemporary knowledge in philosophy and life sciences. Updated appraisal of *consistencies* between spirituality and science are extremely important in religious formation, in the care and support of people who are perplexed or in crisis on the basis of new understanding in either sphere, and in the promotion of resilience among individuals who have experienced significant adverse life events.

Resolution of existential concerns evoked by faith/science conundrums are relevant to all people (Doeselaar et al., 2018), because perceptions about individual freedom, the consequences of mortality, and the maturation of identity are deeply embedded in many critical aspects of human development, whether viewed from a philosophical, psychological, or spiritual perspective. We first briefly review the developmental context in which our approach to the reconciliation of spirituality and science is proposed.

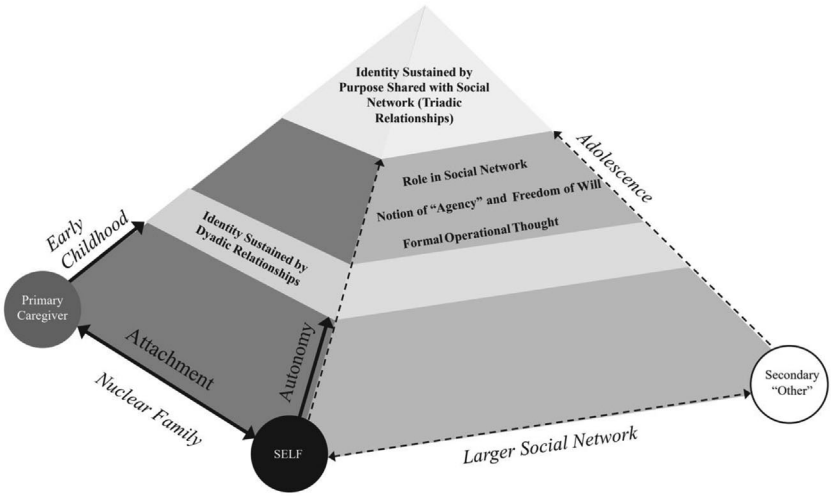

Figure 1. The architecture of social identity, reprinted from Baumel and Constantino (2020). Schematic depiction of developmental milestones relevant to discovery of purpose/meaning and the capacity to resolve existential concerns. In this schema, identity in childhood is principally derived from experience in dyadic family relationships. In adolescence, the context for identity shifts from the nuclear family to the larger social network, and developmental acquisition of the capacity for self-reflection and formal operational thinking prompt questions about one's place in and value to society. Clinical resolution of depression may be facilitated by specific attention to missed steps in identity formation, as depicted here.

A Developmental Context for Reconciling Faith and Science

A child's mastery of the ability to form a human relationship is a bedrock of social competence, and by extension, of identity, that is, the manner in which he or she comes to define "self" as distinct from—while simultaneously connected to—"other." Just as existential conflict challenges identity and renders it fragile, secure relationships bolster identity. Successful relationships require the balancing of two seemingly opposed developmental "forces"—the psychological drive to attach (i.e., achieve emotional connection) and the drive to separate (i.e., exercise autonomy)—in relation to another human being (these are represented at the base of Figure 1). It is the lived experience of successful integration of attachment and separation (the essence of a prototypic human relationship) through which identity matures (Constantino et al., 2002); Table 1 depicts this progression and aligns it with the various terminologies that are used in describing moral and psychological development, either from scientific, philosophical, or

Table 1. Alignment of terminologies and concepts relevant to the developmental context of common existential crises

Domain	*Self*	*Self in relation to other (dyad)*	*Self in relation to all (religion)*
Moral development	Hedonism	Sanction-orientation	Moral motivation
Personality (seven-factor model)	Self-directedness	Cooperativeness	Self-transcendence
Psychology	Attachment	Separation (boundaries)	Capacity to love without condition
Defenses (against hopelessness)	Denial/rationalization	Intellectualization	Sublimation, altruism
Philosophy	Agency, freedom	Responsibility	Justice, meaning
Spiritual	Survival	Cognizance of "higher power"	Alignment of life with universe
Relevant advances in neuroscience	Model of brain, mind, consciousness	Genetic, environmental, and stochastic influences on human behavior	
Existential concerns	Determinism (vs. "free will")	Mortality	Isolation of identity

The table is organized by domain of human development (moral, psychological, philosophical, spiritual) across the continuum of maturation-of-identity from that exclusively defined in relation to self, to that principally defined in relation to *all* (see text for further details). It is important to note that disparate terminologies of the respective scholarly traditions that address this developmental progression preserve important nuances of understanding, but also introduce language "disconnects" that can confound efforts to reconcile spirituality and science across disciplines. Here, for the sake of clarity and emphasis, we have omitted breakdown by stages in the development of cognition, which can affect the timing and acquisition of the milestones depicted in any given row.

religious perspectives (disconnects in the *language* used across disciplines can present barriers to reconciliation of perspectives on faith and science). We note that clinical disorders of relationship-relevant behavior, the personality disorders, can be traced to disruptions of either attachment (a consequence to identity is lack of a sense of agency) or separation (a consequence of which is lack of the ability to cooperate) (Cloninger et al., 1993; Svrakic et al., 1993). Stressors that overwhelm the psychological *defenses* at a given stage of maturation commonly result in loss of hope in the ability to: (1) direct the course of one's own life (i.e., feeling helpless, controlled, or out of control), (2) rely on the support of others (i.e., feeling marginalized or cheated out of opportunity), and/or (3) construct a fulfilling existence in the timeframe of a limited lifetime (Baumel and Constantino 2020).

Maturation of identity proceeds in adolescence along two axes. The first is the psychological motivation to relate to a larger society (not just to a single attachment figure as is the case for an infant's dyadic relationship with a primary caregiver). This involves steady progression from dyadic to *triadic* relationships (Figure 1) in which connection and autonomy are maintained for multiple parties simultaneously. The second is a specific progression of cognitive development that occurs around the time of puberty: it involves new acquisition of the capacity for formal operational thinking (e.g., abstraction, hypothesis-testing), and its implications for predictive reasoning, anticipating, and planning for the future, and assimilation of wider circles of new knowledge about the world. This is now also a time of accelerated exposure to information about self and the world through social media and the internet.

It is during early adolescence that existential threats to autonomy/individuality become particularly prominent, in the form of concerns about isolation, death, and meaninglessness (Hacker 2014; Baumel and Constantino 2020). These are buffered by defense mechanisms (Table 1) that are, at first, primitive and immature (e.g., denial and consequent risk-taking behavior). In healthy development, immature defenses are gradually replaced by more mature ones that are characterized by a greater degree of recognition and acceptance of truths regarding self and other (see Viorst 1998). For example, whereas suppression or acting out of negative emotions occur in the setting of immature defenses, such emotions are harnessed for a constructive purpose (sublimation) or transformed altogether through acts of altruism (i.e., toward others experiencing similar hardship) in more mature individuals. An identity as both autonomous and capable of sustaining meaningful connection to others is a developmental foundation of resilience and transcendence of self, as depicted in Figure 1. **Conflicts that emerge between faith and science—and that evoke existential concerns about agency and mortality—can pose a**

direct threat to identity whenever such difficult concerns overwhelm an individual's defense mechanisms.

It is also important to consider the manner in which perceived conflicts between faith and science contribute to the *absence* of personal investment in spirituality, or what has been observed as a progressive distancing of the current generation of adolescents and young adults from initiating such investment in the first place (Dinges 2018). This may be an unnecessary loss, and the preservation of compelling *options* for spiritual formation confer important prospects for resilience, buffering stress, and recovery (as occurs in 12-step programs, see below) for all people. Individuals exposed to some of the harshest aspects of reality—epitomized by Holocaust survivors described in the writings of Frankl (2006), who asserted that those "who have a *why* to live can bear almost any *how*"—can ill afford to have useful spiritual foundations compromised by unnecessary conflicts with modern science.

In summary, a practical framework for reconciling faith and science—one that is particularly accessible to adolescents and young adults—may have a surprising array of potential applications, including innovations in clinical intervention, religious formation, and support of the development of identity, meaning, and resilience. All of these opportunities motivate this particular synthesis of relevant literature in psychology, philosophy, and neuroscience. We fully recognize that the scope of scholarly work on the integration of religion and science is vast, as broadly covered in the contents of this journal for over 50 years. We have chosen in this article to focus on what we believe is most salient to the resolution or prevention of clinical crises of hope among youth and young adults, and what might be learned from this perspective for the broader enterprise.

We are not aware of any previously published resource that traces hopelessness—when precipitated or aggravated by perceived conflicts between faith and science—to three critical issues: (1) underestimation of the capacity for freedom of will; (2) underestimation of opportunity for meaning or purpose (especially when mortality is more seriously perceived as final); and (3) underestimation of implications of the phenomenon of human love for practical constructs of spiritual identity. Many aspects of free will, meaning, and love can be explored in greater detail in original, at times more esoteric, works in philosophy, theology, and the sciences—which we cite herein and to which readers of our article are referred for additional reading. But this article has been motivated by the conviction that a focused review in relation to crises of hope is of particular relevance, to reverse a widening gap between faith and science, one that is particularly (and at times literally) demoralizing to young people of faith.

The Nature of Faith–Science Conflicts in Existential Crises

As stated in the introduction, conflicts between faith and science typically precipitate existential crises when knowledge of science challenges previously held religious beliefs, or when such beliefs—having played an important developmental role in hope or identity—are subsequently lost. Faith and science conflicts can arise in other directions (e.g., when faith broadens narrow perspectives of science or clinical practice) but these occurrences generally raise hope and are not threatening to identity. When faith is challenged or compromised, and knowledge of the observable "here and now" is all that can be relied upon to sustain hope and identity, the most immediate implications are for free will, mortality, and identity. **Concerns about free will arise from reductionism in the interpretation of scientific understanding of brain function.** The essential perspective is that if all thinking and behavior can be traced to the function of neurobiological circuitry, and, in turn, the data encoded in these circuits can be used to reliably predict outcomes, then we are machines at the mercy of the cause-and-effect sequences of biological processes. Our approach to this problem is to show how this perspective is rooted in a specific fallacy, that predictability is incompatible with freedom. We will provide an updated appraisal of philosophical and biological understanding of *compatibilism* leveraging the respective contributions of philosophers John Perry and Daniel Dennett, along with consideration of two key corollaries of the free will problem: first, risks of invoking dualism and second, the relationship between free will and meaning (or "purpose").

By definition, *dualism* places spirituality squarely "outside of the box" of brain and biological function. In this article, we develop an integration of science and spirituality that does *not* depend upon dualism or upon any overt dichotomization of physical versus spiritual reality. This is not to reject the notion that there exists an immaterial component of human existence (a soul), rather to root this particular reconciliation of science and spirituality in the common ground of the observable, particularly for people in crisis. Of many challenges to dualism that have been rendered over centuries of philosophical writing, one of the most accessible to scientists is that dualism violates the first law of thermodynamics (conservation of mass and energy): if an immaterial agent were capable of interruption or disruption of a physical (brain-based) process, conservation of mass and energy would be violated. This is a "nonstarter" for people of science and therefore we have chosen to avoid invoking dualism in this reconciliation of science and spirituality. Although this may be a very difficult "loss" or concession in some religious traditions, it averts trading one source of loss of control for another—whether one is "controlled" by one's brain or by a spiritual entity over which there is no biological control, the scenarios are

potentially equally compromising of human autonomy. In what follows we will address implications of contemporary models of human consciousness that are consistent with an individual's capacity to choose freely whether or not one invokes the existence of spiritual influences divorced from the physical world.

A corollary of the free will problem is that human *meaning* depends critically upon the capacity to make choices, a position that that we and others (William James 1910; Frankl 2006) have taken as a foundational philosophical assumption. One of the remarkable scientific observations of the twentieth century was that the phenomenon of clinical depression could be biologically recapitulated in rodents in "learned helplessness" experiments in which the animals were forced to learn that they had no choices in behavioral strategies to avoid aversive stimuli (e.g., foot shocks). In humans, learned helplessness—to be distinguished from intentional relinquishing of choice as a matter of transcendence under conditions that cannot be changed—is a potent inducer of depression. The relevance to identity of whether one is free to make choices can hardly be overstated: behavior differs radically under one assumption versus the other, and any significant challenge to an assumption of freedom can precipitate serious existential concerns.

Next is the issue of *mortality*. The problem is articulated in Shakespeare's *Macbeth* ([1606] 2021), that the inevitability of mortality drowns any possibility of meaning, even in the presence of free will:

> Life's but a walking shadow, a poor player
> That struts and frets his hour upon the stage
> And then is heard no more. It is a tale
> Told by an idiot, full of sound and fury,
> Signifying nothing
>
> (William Shakespeare, *Macbeth* 5.5.23–27).

We will attempt to deconstruct such desperate perspectives on mortality by considering the counterfactual, that is, the implications for meaning if there were no such thing as mortality. We will present the view that mortality may actually reify opportunity for meaningful decision-making (in our clinical experience this often comes as a surprise to patients in crisis), including acts of personal heroism. In this article, we consider mortality as inevitable and unconditional—we have no intention to dismiss possibilities for existential continuity following death (heaven) as espoused by many major religions, we view this as unknowable and thereby outside-of-scope of reconciling science and faith.

A final clinical issue raised by unresolved conflicts between faith and science is that of *identity*: this occurs particularly when a personal decision to reject dualism (i.e., abandon the notion of an immaterial component of human existence) is felt to be incompatible with spiritual identity. Here,

it is helpful to point out that in the clinical treatment of addictions, a "higher power" is often invoked as a *prerequisite* for recovery (e.g., in 12-step programs), but does not necessarily specify that it must be supernatural. A useful parameterization of *higher power* in this context includes, for example, an enduring relationship with a trusted friend who is relied upon for unconditional love and support.

In this article, we take the position that each of these problems arise from broad underestimation of both human neurobiology and real-world manifestations of spirituality, including the phenomenon of human love (see Constantino 1991, 2001). Lack of personal experience with the latter can be a particularly potent constraint on recognizing manifestations of spirituality in day-to-day life, as might occur for individuals who have never been unconditionally loved, have undergone serious or overwhelming traumatic life events, or who are otherwise compromised in their capacity to engage in healthy human relationships.

Reconciling Faith and Science in Crises of Hope

Based upon the model of human development we have outlined above, and the specific clinical consequences of unresolved conflict between faith and science that we have summarized as context, we turn now to the contemporary literature in philosophy and cognitive neuroscience to address the three key issues that lie at the interface: (1) we will first describe a practical resolution of the free will problem on the basis of current scientific and philosophical perspectives on *compatibilism*; (2) we contend that the meaning or purpose of autonomous decisions are better preserved under the condition of mortality than under the condition of the *counterfactual* (i.e., the consequences for meaning if there were no such thing as mortality); and (3) we propose a reconceptualization of spiritual identity predicated upon (a) the observable phenomenon of human love and (b) contemporary understanding of the capacity for self-transcendence.

Compatibilism and the Free Will Problem. Compatibilism refers to the notion that "free" or autonomous decisions are compatible with natural causation—that is, the cause-effect sequences of nature—and that both can be fully accounted-for within the functional repertoire of a human mind. The principal concern in crises of hope is that a natural chain of causation that resolves to brain circuitry must somehow be "fixed" or determined, such that there is no room for freedom of will unless an external actor or force or God (which is referred to below in more general terms as a *semantic engine* as a generator of meaning) is pulled into the equation (i.e., invoking dualism). And that without such an external entity to break out of the chain of causation of the biological system of brain and mind—that is, in the absence of belief in God as a separable external entity—there

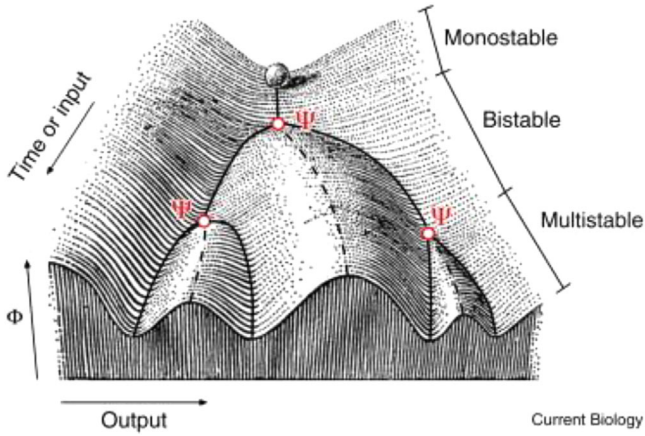

Figure 2. Waddington's Landscape, a marble rolls down a hill with peaks and troughs, as a visual representation of "decision points" in systems of neural development and function. As the marble rolls down the hill (over the course of time), random forces determine whether it goes right or left at the points of bifurcation. Within the troughs, there is minimal flexibility for outcome, until a next point of bifurcation is reached. Biological systems amplify the impact of random events when the landscape for determination is flattened, allowing even minor perturbations to have major influences on outcome. [Color figure can be viewed at wileyonlinelibrary.com]

is no opportunity for freedom of will nor therefore meaningful decision-making. We concentrate here on the fallacy that whatever is "determined" via the natural causation inherent in the circuitry of brain and mind is incompatible with freedom of decision-making. To address this, we briefly elaborate the philosophical position of *compatibilism*, as a foundation for resolution of the free will problem in crises of hope. For excellent detailed original works on this position, readers are referred to Perry (2010) and Dennett (2015), whose insights are particularly relevant and which we have judiciously incorporated into this section.

As a preface to addressing the compatibility of causal determination and freedom, it is first important to point out that within the realm of science there are important known boundaries on what is determinable. In physics, the Heisenberg Uncertainty Principle asserts that the exact position and momentum of an object cannot be measured nor known for the same instant of time. The position and momentum exist (i.e., follow *natural causation*), yet the determination of these two physical properties is clouded in uncertainty. A corollary in brain development and function is a stochastic influence, illustrated by Waddington's Landscape (Figure 2; Waddington 1957), which is a random event of usually minor significance, but whose influence is greatly amplified when it occurs at just the right time. Figure 2 schematically illustrates this as forks in the path of a

marble rolling down a three-dimensional surface. It has been demonstrated in both human (White 2019; Castelbaum et al., 2020) and animal brain and behavioral systems (Kees-Jan Kan et al., 2012) that stochastic influences can have pronounced effects during critical periods or in states of stress or impairment, which are otherwise buffered in more "canalized" epochs of development (Ferrell 2012; Andrew Feinberg 2012).

Another important embedded feature of neural systems that limits their determinability and enables their emergent properties (see below) is level of complexity. Crises of hope engender reductionist views of the circumstances of life, in which absence of agency is likened to simple metaphors such as being a puppet on a string or a dog on a leash or a line of dominoes. An object as inanimate as a silicon chip can, itself, store libraries of musical or theatrical performance that are capable of inspiring and motivating human behavior. The brain and mind comprise a dynamic and vastly parallel and analog *system* of such storage functions that can be turned on or off, called up at will, amplified, mitigated, integrated, and organized in service of intention and action. It is with this background that we proceed with John Perry's formulation of the foundational position of compatibilism, here applied to a conscious decision:

> An act can be free, in the sense that we could have done otherwise [i.e., had competence and opportunity] even if the state of the relevant part of the universe at some time previous to our doing it or not doing it and the laws of nature settle that we will do it. (Perry 2010, 97)

Perry distinguishes the chain of causation in making a singular choice from the issue of whether it is possible to alter that choice at the moment of decision. To illustrate this, he describes the logic sequence guiding selection of a particular brand of milk from the grocery store, on the basis of his wife's preference, given many brands to choose from, emphasizing the *predictability* of his action. He maintains, however, that he *could have* selected a different brand at the moment of decision-making, even if it violated the usual reasons for milk selection, and that this capacity to override a rational sequence is a representation of freedom in decision-making. This position is articulated in clinical scenarios in which individuals stand at the brink of serious or irrevocable instances of harm to self or others—empowering them to exercise ownership of decisions to preserve life and safety rather than destroy it, and clarifying that their ability to do so is a refutation of some of their own worst fears (i.e., that they are powerless to chart the course of their own destiny). Such moments of decision-making were also articulated by Locke:

> For the mind having in most cases, as is evident in experience, a power to *suspend* the execution and satisfaction of any of its desires; and so all, one after another; is at liberty to consider the objects of them, examine them on all sides, and weigh them with others. In this lies the liberty man has…in

> this seems to consist that which is (as I think improperly) called *free-will*. For during this suspension of any desire…we have opportunity to examine, view, and judge of the good or evil of what we are going to do; and when, upon due examination we have judged we have done our duty; and it is not a fault, but a perfection of our nature, to desire, will, and act according to the last results of fair examination. (John Locke 1959, Essay, II, XXI, 48)

In his seminal work, *Elbow Room—The Varieties of Free Will Worth Wanting*, Dennett (2015) emphasizes that the neural architecture of human consciousness is such that an act can *simultaneously* represent (1) the effect of a physical chain of causation mediated by brain circuitry, *and* (2) the result of the execution of the decision of a rational will, irrespective of whether there exist tendencies to act in predictable ways under particular circumstances. Contemporary models of consciousness incorporate understanding that the brain is designed to manage the parallel processes of sensorimotor function, cognition, and emotion, each of which can contribute to the continuous stream of awareness moment-to-moment over time, and it is a particular necessity and function of the brain to prioritize (conscious) or de-prioritize (unconscious) "details" of these parallel streams of information in service of moment-to-moment predictive modeling, intentionality, and choice.

Reminiscent of Locke's perspective, Dennett highlights the human capacity for self-reflection in conscious decision-making—the ability to examine, probe, question, and choose between alternatives—and to do so repeatedly and at increasing levels of depth and complexity over the course of development and maturation. He makes the case that in practical terms, and when considering physical limits imposed by (a) the speed of nerve conduction and (b) the time it takes to process a given input (whether generated by the brain itself or by a separable semantic engine), the human brain *approximates* the function of a semantic engine (i.e., a meaning generator) so closely that there is no meaningful difference between the respective capabilities that could be ascribed to one versus the other.

> "Only some of the portions of the physical universe have the property of being caused to have reliable expectations about what will happen next, and hence have the capacity to control things, including themselves. And only some of these have the further capacity of significant self-improvement (through learning). And fewer still have the open-ended capacity (required a language of self-description) for "radical self-evaluation." These portions of the world are thus loci of self-control, of talent, of decision-making. They have projects, interests, and values they create in the course of their own self-evaluation and self-definition. How much less like a domino could a portion of the physical world be?" (Dennett 2015, 109).

This human capacity to "construct" self through iterative processes of reflection, self-evaluation, and decision-making is a critical element of Dennett's model (he refers to this as the construct of "self-made selves").

Beginning with *blind* trial and error, our interactions with the world as infants are shaped by reinforcement, but these interactions identify learning opportunities that, according to Dennett, become candidates for *nonblind* consideration, and the architecture of meaning-guided decision-making. Over the course of human evolution, the mind has become "a more and more reliable mimic of the perfect semantic engine (the entity that hears Reason's voice directly), because it was designed to be capable of improving itself in this regard; it was designed to be indefinitely self-redesigning" (Dennett 2015, 34).

In this view, invoking an immaterial component of decision-making (i.e., outside of physical reality) is *unnecessary* for establishing the capacity for free will, and actually complicates things by raising the problem of who or what is actually in control: the "external" influence of an immaterial component of mind could paradoxically *lower* the level of freedom that an autonomous human mind actually possesses, if that external influence were *coercing* the decision-making in a way that conflicts with the will of the individual. This raises the question of whether there is any "value-added" to freedom even when an external semantic engine is invoked (i.e., over and above that which is already within the capability of a human brain and mind). The inherent capacity for self-redesign through learning, self-reflection, and choice mediates not only freedom but identity ("self-made selves") and creativity (often regarded as a reflection of the Divine) within a living system.

Importantly, within such a system, reasons for doing things do not need to be biologically reflexive or to make sense evolutionarily, a point to which we will return in the sections below. When making decisions, we use strategies that allow us to choose responses most in line with the reasons, beliefs, and identity that are forged in the course of life experience. Some decisions have little impact on identity, such as what type of milk I will select. Others hold identity more centrally, such as what profession I will enter. Furthermore, in making decisions, the parallel inputs are so numerous that we cannot evaluate every possible variable and factor in an endless or perseverative regression to the origin of every thought or consideration. This would lead to paralysis. The interjection of time makes it incumbent upon an individual to enact decisions within timeframes required for intended effects and anticipated consequences. Thus, the ability to decide when to "stop" mental regressions, and instead employ heuristic methods that give us the best approximation we can make is an important parameter of self-control, one that can be severely compromised in obsessional states or syndromes. In this context, a "leap of faith" can be seen as a decision to prioritize what is more versus less aligned with the highest values of a self-made self.

Even if determinism holds sway *within* any of the contributing parallel processes (awareness, reflection on the alternatives, "stopping"), Dennett clarifies that those causal processes alone cannot account for the level of overarching control experienced in human agency, which leverages self-observation and the use of information feedback loops to adjust courses of action based on the assimilation of new information (learning):

> If we are also deterministic devices, we need not on that account fear that we cannot be in control of ourselves and our destinies. Moreover, the past does not control us. It no more controls us than the people at NASA can control the spaceships that have wandered out of reach in space…Causal links are not enough for control. There must also be feedback to inform the controller. There are no feedback signals from the present to the past for the past to exploit. Moreover, there is nothing in the past to foresee and plan for our particular acts, even if it is true that Mother Nature—gambling on our general needs and predicaments—did, in effect, design us to fend quite well for ourselves…". (Dennett 2015, 79–80)

Moving beyond the immediate "self," Dennett clarifies that decision-making does not exist in a vacuum, rather the repertoire of opportunity is expanded by social context. Our role in a "village" affords the option to extend beyond internally directed desires to those of shared interest and purpose. This introduces yet another dimension of input into any given instance of decision-making. "It is our communal activity of mutual persuasion, reflection, and evaluation that *creates* the values that then take precedence over the cruder interests of our ancestors" (Dennett 2015, 51, italics added for emphasis). In a consideration reminiscent of the opening of the Gospel according to St. John, "In the beginning was the Word, and the Word was with God, and the Word was God" (John 1:1, *NRSV Bible*), Dennett places special emphasis on the role of language as a key mediator of our ability to engage with one another in persuasion, reflection, and conversation to shape the construction (creation) of ourselves. Through communication (including abstract expression through the arts), our goals, desires, and purpose can be extended beyond the corporal and temporal limitations of self. We can *share* our internal cognitive states, represent abstractions, and analogize representations of the world around us and within us—both tangible and intangible, again allowing for reason to extend beyond what recapitulates evolutionary "practicality":

> The rationality Nature has endowed us with is practical; it makes a difference by moving us, for the most part, in appropriate directions. But we must not suppose that it is only practical, that it is an endowment tied directly and rigidly to serving the biological ends that gave birth to it…a particular powerful part of that endowment derives from our capacity for language…Without having an important biological function to serve, something as complex as language could never evolve. But once it has arrived on the evolutionary scene, the endowment for language makes room for all manner of biologically trivial or irrelevant or baroque (nonfunctional)

> endeavors: gossip, riddles, poetry, philosophy. In seeing how evolution has made reason practical, we have also seen how evolution can give birth to impractical reason. (Dennett 2015, 53–54)

Finally, Dennett emphasizes the importance of *belief* in one's own freedom, without which it is literally impossible to engage it. **It is this construct of "faith"—that we must believe in our own freedom to participate in decision-making—that represents another tangible and under-appreciated point of common ground for reconciling spirituality and science.** The absence of faith can sabotage freedom through the self-fulfilling prophesy of helplessness:

> We all know the feeling at times: the terrible existential funk in which we recognize that we have slid self-defeatingly into the passive spectator attitude, fecklessly wondering what we are going to do, or think, next. Instead of thinking ahead, planning and hoping and trying to anticipate the world, we spiral down into a regress of self-preoccupation that squanders our time, virtually guaranteeing that our self-image of futility and indecision come true. For it is very likely…that believing that one has free will is itself one of the necessary conditions for *having* free will: an agent who enjoyed the other necessary conditions for free will—rationality, and the capacity for higher order self-control and self-reflection—but who has been hoodwinked into believing he lacked free will would be almost as incapacitated for free, responsible choice by that belief as by the lack of any of the other necessary conditions. (Dennett 2015, 183)

In a summarizing appeal to those still skeptical about whether freedom is "built in" to the biological architecture of human consciousness, Dennett states the following:

> Ask yourself: can I even conceive of beings whose wills are freer than our own? What regrettable feature of our lot as physical organisms is not a feature of their lot? … There's no sense wringing our hands because we can't undo the past, and can't prevent an event that actually happens, and can't create ourselves *ex nihilo*, and can't choose both alternatives to a decision point, and can't be perfect. (Dennett 2015, 188)

In clinical practice, resolving the free will problem, and thereby reassuring a patient that he or she possesses the capacity to make meaningful decisions, is a critical antidote when helplessness (in this case the assumption that loss of faith means loss of capacity to choose) is a principal driver of major depression or a crisis of hope. Further details on resolution of existential conflict in the clinical management of major depression are elaborated in Baumel and Constantino (2020), to which interested readers are referred. In the text box below, we provide an example, Clinical Vignette 1, a case that highlights the relevance of compelling reassurance about freedom of will to clinical outcome.

Clinical Vignette 1. Following the experience of a concussion from which he fully recovered, J. L., a 24-year-old accountant became absorbed with the idea that his awareness of God was wholly dependent upon the intact functioning of his brain, to the extent that he came to view his religious beliefs as fragile and somewhat disingenuous, especially since God was supposed to have more power than a brain. He generalized this line of thinking to the point of believing that he had no real control over the decisions he made, and gradually capitulated to a position of accepting and acting upon impulse, in a chronic state of disbelief that there could be any source of control over the course of his life other than "what my brain tells me to do." He externalized responsibility for both successes and failures, lost motivation to pursue personal and occupational goals, started neglecting household tasks, followed by his work; this eroded his relationships with close friends and family members, and ultimately, he lost his job. He began drinking heavily for the first time in his life and retreated to a position of helplessness and fatalism. He viewed himself and others as "pawns" in the succession of human generations, as beings unworthy of the time or esteem of others or the community resources they depleted by being alive. He became convinced that both he and the world would be better off if he were dead, and viewed himself as a being of a different substance than God, tethered to his own biology, and thereby irrevocably cut off from God. The approach to his clinical care began with a 12-step program in which he identified as a "higher power" a close loved one whom he admired deeply and who had expressed to him how personally devastating it would be if he were to end his life. He complied with the program and his drinking problem resolved. In individual therapy, he was helped to understand how the *assumption of helplessness* had itself triggered a wholesale conversion of his life, and he began to explore his own perspective on the nature of God, including the layers of similarity between the will and love of God and that expressed by his "higher power." He considered deeply whether he expected God to be the primary source of "control" of his life—any more than his "higher power" would be considered the source of control of his drinking—or rather a proponent of his own freedom. Gradually, a sense of agency over the course of his own life was restored, his notion of God reconciled with recognition of ways in which spirituality can manifest in the material world (including its tangible impact on his own recovery), and his depression resolved.

In concluding this section on the free will problem, we wish to clarify that neither John Perry nor Daniel Dennett elaborate their philosophical positions for the purpose of supporting religious faith per se—here we have summarized their insights to establish a plausible scientific framework for

human freedom that does not depend upon an immaterial or supernatural semantic engine. In the sections below, we will address how human brain and mind can be directed toward the pursuit of spirituality, conceptualized according to its manifestations in the observable world.

Mortality and Its Counterfactual. The fatalistic perspective articulated by Shakespeare's *MacBeth* ([1606] 2021)—that if all roads lead to death *how can anything mean anything?*—is a universal existential question. In states of pain or suffering, or when death seems particularly imminent, it is common for distressed individuals to express a wish to "get it over with rather than prolonging the misery." This is said to have been experienced by St. Francis DeSales (Wright 1988) who, when reflecting upon his indulgent young adulthood, reached the inescapable conclusion that he was destined never to reach heaven. He proceeded to isolate himself in his room for *months*, during the course of which historical characterizations of his behavior are reminiscent of textbook descriptions of melancholic depression. St. Francis' emergence from his room was famously predicated upon a *decision* to accept his unworthiness of heaven and to make the most of the only life he had. Having a sense of urgency and the preciousness of something that was time-limited, he embarked upon a life of extraordinary productivity, including distinguished missionary work, prolific writing (he is memorialized as the patron saint of authors), and the founding of a religious order. His motivation as a priest reflected an avoidance of wishful thinking about heaven, rather on what could be done in service of the Divine in the here and now.

Another perspective on acceptance of death was articulated by a young school-aged boy who had been brought up in a religious tradition and described a sense of guilt that he had decided he did not *want* to go to heaven, indicating that "forever is a really, long time and sooner or later it would get boring and everybody would be standing around with nothing left to say." As allegorically depicted in the comedy *Groundhog Day*, the prospect of immortality elicits its own existential problems. Studies in the field of positive psychology suggest that when individuals consciously remind themselves of an impending end point (e.g., only two more months left of college), they experience events as more meaningful and assert that they utilize the time they have left to greater advantage (Bono 2018). By extension, in the absence of any end point (death in particular), it is conceivable that no decision would have any particularly meaningful consequence; there would be an eternity to "make up" for any mistake that was made or any action with an undesired consequence. In this sense, mortality functions as a substrate for both meaning and *creativity* (the ability to bring into being, through time-limited decision-making, what would not otherwise exist), a capacity commonly attributed to God, but here within the repertoire of every human life.

Clinical Vignette 2. Following the breakup of a romantic relationship, a college student became increasingly concerned about mortality and the direction and purpose of her life. She entertained serious doubts about the prospect of heaven (a fixture of her religious upbringing) and began frantically reaching out to friends to determine whether they had had similar experiences. She became disillusioned with her long-term plan of earning a liberal arts degree that she considered a waste of the limited time she had to live her life, and could not conceive of anything worth doing because all roads would lead to death. She became deeply absorbed with questions about whether anything meant anything, and exquisitely sensitive to environmental triggers that reminded her of death; for example, roadside trash reminded her of the destruction of the earth's environment and this intensified a sense of futility about her own existence. She had no evidence of disordered thought and was completely cooperative, articulate, and earnestly sought out clinical support. She acknowledged that she had lost hope that there would ever be a pathway to meaning in her life ("I've tried everything and I just can't find a way out of this") and was beginning to contemplate a way to hasten her own demise, because of how stressful and anxiety-provoking it was to "wait around for the inevitable."

The approach to her treatment began with an examination of her concern about mortality, including presentation of a hypothetical scenario in which there was no such thing as death. She was encouraged to explore the consequences of her own decisions and actions in this scenario, and came to the conclusion that the lack of the boundary of death would diminish rather than accentuate the impact of the decisions she made and actions she undertook in her endless life. She remained agitated about the prospect of death, questioning why life ending in death was worth the heartache and struggle. This prompted a next series of therapeutic encounters focused on what she construed as good causes in life, which centered around a compassionate societal infrastructure for the less fortunate. She was asked to consider whether she believed it would be best for *their* lives to be "over with" so as not to suffer unnecessarily, a notion that she perceived as viscerally abhorrent. When asked why she should view the prospect of intentionally terminating life differently when applied to herself than for others, she was initially at a loss—the contrast took her somewhat by surprise—but she recognized within herself a longing to champion the quality of life for others. She identified with the likely impact of her actions on others as she herself had the experience of being loved and supported by her family, and came to view herself as a link in a chain of causation across generations, in which the quality of any given life was influenced by the nature of connections with all others, and the strength of those connections was determined by intentional decisions to help one another. Her condition gradually improved, she switched to

an academic track in engineering that would afford her opportunity to work on solutions to infrastructure problems that seriously compromised quality of life for people in cities. Her anxiety about death and perseveration about meaning gradually dissipated and her hope in her own future was restored.

This "glass-half-full" view of mortality as a kind of *mercy*—an enhancer rather than a detractor of meaning—carries the potential to disarm the more paralyzing and nihilistic preoccupations with mortality that occur in clinical crises of hope, as illustrated in Clinical Vignette 2. Returning to Dennett (2015), if the cognitive architecture of the human brain makes possible the construction of self, and the consequences of autonomous decision-making enable an extension of the impact of self upon universe, even beyond the time of death (e.g., the legacy of St. Francis DeSales), then people are substantively endowed with the power to affect the world in ways that transcend the boundaries of self and the interval of a lifetime. Redefining identity as distributable across time and space and inclusive of an individual's life work and its consequences, as captured in the spiritual tradition of *Yizkor* in Judaism, comprise an alternate representation of life after death.

Recognition of mortality is also associated with a specific type of anxiety over what one ought to do with the time left to live. The dread of decision-making in this context is potentially paralyzing as considered by Søren Kierkegaard: "One may liken angst to dizziness. He whose eye chances to look down into the yawning abyss becomes dizzy…Angst is the dizziness of freedom which emerges when the spirit would posit the synthesis, and freedom then gazes down into its own possibility, grasping finiteness to sustain itself. Freedom succumbs in this dizziness" (Søren Kierkegaard [1844] 1980, 152). In another sense, however, the induction of anxiety over the existential concern of choice functions as its own driver of creativity as noted by the philosopher Charlie Kurth, the fact that one can experience anxiety in a decision "captures something admirable about you—namely, your sensitivity to the significance of the decision you must make and your awareness of the limits of your knowledge and experience in the matters…your anxiety doesn't just help you make a better decision…it's also the epitome of your virtuous concern" (Kurth 2018, 5).

Love-Based Decision-Making and the Transcendence of Self. Are you surrounded by blood and mud?
I am divine! I am oblivion!
I am the God that descends on Earth
From the Empyrean, I make of the earth
A heaven! Ah!
I am love

—(Umberto Giordano, Andrea Chenier *(La mamma morta)* 1896)

Having established a framework for human freedom, and the principle that mortality may *enhance* rather than detract from the consequences of decision-making in a given life, we turn now to the nature of decision-making in relation to spirituality. We begin with the opportunity described above by Dennett to diverge from what is biologically or evolutionarily "reflexive," that is, to engage in "impractical reason." As stated by Richard Dawkins: "We have the power to defy the selfish genes of our birth…We can even discuss ways of deliberately cultivating and nurturing pure, disinterested altruism—something that has no place in nature [that is, in a Hobbesian state of nature—DCD], something that has never existed before in the whole history of the world…We, alone on earth, can rebel against the tyranny of the selfish replicators" (Dawkins 1976, 215).

Exercising freedom in the intentional pursuit of spiritual decision-making can take many forms—reflection, meditation, contemplation, prayer, and other specific expressions of spiritual devotion. One of the more pragmatic forms considered "sacred" among both religious and non-religious people is the phenomenon of human love. When construed as decision-making rather than as emotion per se, it involves exercising human freedom to place the needs of "other" over the needs of self. It can be differentiated from altruism in that decisions to love are rendered without condition or inference of ecological advantage. It represents a break from evolutionarily preserved impulses to protect self, and is considered an "opposite" of many constructs (simultaneously), including selfishness, hatred, and notably fear. The latter is a particularly important distinction, since fear is often the root of hatred and self-absorption and functions as a self-preservation reflex, typically antithetical to the kinds of freedom we have described here, except when acted upon vicariously as in the protection of a loved one. Since decisions to love are unfettered by contingency, the need for psychological assurance, or expectation of reciprocity, love has been considered the ultimate manifestation of the human capacity for free will (Walsch 1995, 18–19), the architecture for which is built in to human consciousness, as we have elaborated here. Aspiring to a life dominated by loving can itself be viewed as a longer-term choice between autonomous decision-making and the coercion by more self-preserving instincts (mediated by Dawkins' "selfish genes"), and this contrast serves as a pragmatic distinction between spiritual and nonspiritual orientation *within* the material world.

To the extent that *meaning* is linked to the level of freedom in decision-making, it would follow that decisions to love are among the most meaningful that can be made in a lifetime: they result in the intentional bringing-into-being of what would not otherwise have existed, as in a love relationship, an act of love, or a work motivated by love. In this sense, it is a tangible manifestation of the capacity to create de novo, from start to finish—a power that is sometimes reserved for the Divine. It should

be emphasized that while meaning can be generated as a function of freedom in decision-making (e.g., the decision to love), that does not preclude meaning from also being inherent. However, this inherent meaning typically comes to fruition when we encounter the opportunity to partake in our role as "co-creators". Here, we are invoking a pathway to meaning that is accessible to individuals in crisis who formerly construed meaning as *solely* imbued by the Divine.

Love itself is often considered a principal signature of the Divine. Conceiving a human being as capable of making autonomous decisions to love without condition places her/him in a kind of equanimity with the Divine: "Whoever does not love does not know God, for God is love" (1 *John* 4:8, *NRSV Bible*). A conceptualization of spirituality that considers love-based decision-making a material representation of the Divine, allows for the material realm to be construed as common ground for spirituality and science. We note that in the Christian tradition, the incarnation of the Divine in the life of Jesus Christ is manifested more poignantly by love than by miracles, by sacrifice than by triumph, by service to all than by exalting of self. Here we have attempted to provide a substrate for updating contemporary "incarnation theology," and operationalizing aspects of spirituality in the here and now.

Furthermore, the construct of love we have forwarded as a form of decision-making rather than a function of an immaterial soul infers the possibility of an intentional reconstruction of identity to *include* other as of equal or greater priority to self. This is also referred to as *transcendence* of self, reflected in human acts of outreach summarized in the preface of Walt Whitman's *Leaves of Grass*:

> This is what you shall do; Love the earth and sun and the animals, despise riches, give alms to everyone that asks, stand up for the stupid and crazy, devote your income and labor to others, hate tyrants, argue not concerning God, have patience and indulgence toward the people, take off your hat to nothing known or unknown or to any man or number of men, go freely with powerful uneducated persons and with the young and with the mothers of families, read these leaves in the open air every season of every year of your life, re-examine all you have been told at school or church or in any book, dismiss whatever insults your own soul, and your very flesh shall be a great poem and have the richest fluency not only in its words but in the silent lines of its lips and face and between the lashes of your eyes and in every motion and joint of your body. (2005, *Leaves of Grass*, Preface, 1855)

That this is conceivable on the basis of function of brain and mind—that is, freedom, and the capacity for love-based decision-making that materializes transcendence of self and connection with other in an *intentional* re-framing of identity—makes it possible to characterize spirituality in a manner that is compatible with science and observable in the here and now. One of the highest aspirations of major *religions* (from the Latin

religare to re-bind or tie together) is to promote within human societies a whole that is greater than the sum of its parts (in Christianity, "that they may all be one" *John* 17:21, *NRSV Bible*)—both love and altruism tangibly embrace such formation, even when doing so risks diminishment or dissolution of self. Mutual investment in love-based decision-making, by pairs or communities of people—in essence, reciprocal elaboration of transcendence of self—provides a substrate for spiritual *community*, another opportunity for common ground between faith and science, with documented effects in the prevention or resolution of crises of hope (Mosqueiro et al., 2021). Integration with the larger social network redefines identity in a way that transcends temporal and corporal limitations as expressed in the Zulu word "Ubuntu" which translates to, "I am because we are," by which contribution to a societal "*whole*" occurs on the basis of autonomous decision-making. It is possible to derive one's strongest, most sustaining sense of identity—and by extension meaning and purpose—from such personal investment, which includes the formation of "village" composed of families and lasting social networks.

Conclusion

> Reason is in fact the path to faith, and faith takes over once reason can say no more.
>
> —Thomas Merton, *The Ascent of Truth* ([1951] 2002, 29)

In Edwin Abbott's satirical novella, *Flatland* (1884), the human search for the Divine is likened to grappling with the mathematical notion of an extra dimension: its hypothetical universe is constrained to a planar surface, from which a *sphere* is only perceptible in two dimensions, as a dot when it first intersects with the plane, which mysteriously enlarges as a *circle* that subsequently shrinks, and disappears as it makes a passage through Flatland. A marvel even from a two-dimensional perspective, but never fully appreciable for its "sphere-ness." In this article, we have chosen to anchor a reconceptualization of the Divine (a sphere by analogy) through the lens of science (a two-dimensional plane), an enterprise that to some believers may seem an unacceptable level of reductionism, but to the skeptical, a more tangible common ground. As a starting point it may be better to embrace a two-dimensional representation of the Divine than to dismiss its existence altogether, especially if the third dimension has been over-sold, or has unnecessarily discarded science, leaving the implications of what is observable in two dimensions—*tethers* for skeptics—underestimated, devalued, or underappreciated for its promise in reconciling faith and science. Therefore, in this article we have intentionally avoided entanglement over a "third dimension" (i.e., what is characterized by the immaterial: miracles, dualism, or unknowable elements of life after death), and have focused more on aspects of faith that relate to the actions and decisions and op-

portunities of human beings in the observable world, exemplified by the intentional commitment to prioritize other over self, even in the most difficult of life's circumstances, including those encountered in concentration camps described by Frankl and by "heroes of faith" recounted by St. Paul, who included the homeless, imprisoned, and penniless, and "of whom the world was not worthy" (Hebrews 11:37–40, *NRSV Bible*). In Christianity, the epitome of manifestation of the Divine in the natural world is the life of Jesus Christ.

This is not in any way to dismiss or disavow facets of religion that concern themselves with the unknowable, with immaterial dimensions of existence, or with matters of pure faith. Rather, it is to assert that there are foundational aspects of spirituality that are themselves compatible with what is observable in the here-and-now and can be honestly relied upon in crises of hope. Here, we have operationalized decision-making according to the compatibilism of natural causation and human freedom, parameterized "meaning" on the basis of specific opportunities for decision-making within the timeframe of a lifetime and have articulated a model of self-transcendence that avoids unnecessary dichotomization of the material and the Divine. In the Christian tradition, the essence of the Divine was manifest in the physical form of a human being, according to whom spirit is equated with love. Rather than provoking arguments over immaterial aspects of spirituality (miracles, or more literal conceptualizations of life after death), it is our hope that this appraisal of what is tenable on the basis of contemporary understanding of brain and mind and daily life experience will provide a blueprint for contemporary reconciliation of spirituality and science, especially as is necessary in crises of hope that are precipitated by unresolved conflicts between the two.

The common ground that we have invoked for religion and science can be construed as a sort of "bottom-up" rather than "top-down" conceptualization of spirituality; that critical aspects of spiritual life arise as "emergent" properties of brain, mind, and human interaction, according to principles and forces of nature that brought them into existence. In seminal work published in the journal *Neuron*, Krakauer et al. (2017, 484) describe emergent properties in this way:

> Neurons in their aggregate organization cause effects that are not apparent in any single neuron…An example of an emergent behavior that can only be understood at the algorithmic level, which in turn can only be determined by studying the emergent behavior itself, is flocking in birds. First one has to observe the behavior and then one can begin to test simple rules that will lead to reproduction of the behavior, in this case best done through simulation… Clearly, observing or dissecting an individual bird, or even several birds could never derive such a rule. Substitute flocking with a behavior like reaching, and birds for neurons, and it becomes clear how adopting an overly reductionist approach can hinder understanding.

Neuropsychologist and theologian Patrick McNamara (2020) similarly rejects reductionism in neuroscience and asserts that essential truths concern the whole, and wholes cannot be explained simply by decomposing them into their constituent parts. In translating this to crises of faith, the reductionist thinking that leads to the notion "I am not free" or "nothing means anything" constitutes a kind of "throwing out of a baby with the bathwater." Observable manifestations of human spirituality, such as love, can and should serve as an anchoring hope for the perplexed, and as a place to begin a journey of spiritual formation when larger leaps of faith are perceived as bridges too far.

We have approached this exploration of the interface between science and faith with a conviction that spirituality is always "better off" when it fully incorporates scientific truth. This is no easier today than it was when gravitational force replaced Divine intervention as the predominating theory for why the sun rises and sets. Science continuously clarifies what can and cannot be invoked as a foundation of religious belief, and it is in this spirit that scientific understanding of brain and mind are synthesized in this article. To believe otherwise, that is, to contend that one must choose *between* science and faith is a position that we reject, as strongly as we would reject an assertion that one cannot be religious if one accepts the gravitational model of a sunrise. It is our hope that this synthesis of current understanding will open new avenues of dialogue, widen the playing field of opportunity for spiritual formation in a way that is compatible with the inexorable march of scientific progress, and invigorate personal investment in what we believe to be a signature manifestation of spirituality in the observable world, which is human love.

Acknowledgments

The authors gratefully acknowledge Fr. Gary Braun for his leadership of the Catholic Student Center at Washington University in St. Louis, where regular promotion of formal and informal discussion of the interface between science and spirituality served as a significant motivation for this work. The authors also gratefully acknowledge Abbott Gregory Mohrman O.S.B., Rev. Laurence Kriegshauser O.S.B., and three anonymous peer reviewers for their input on earlier versions of this manuscript; acknowledgment of their extremely helpful input is not to imply their endorsement of the views expressed in this work. The Scripture quotations contained herein are from the New Revised Standard Version Bible, copyright 1989, Division of Christian Education of the National Council of Churches of Christ in the United States. Used by permission. All rights reserved. A children's version of the parameterization of freedom-of-will, mortality, and identity described in this article is presented in the form of an 11-minute digital video story that can be accessed at https://vimeo.com/109202496.

References

Abbott, Edwin A. 1884. *Flatland: A Romance in Many Dimensions*. New York: Dover Press.

Baumel, W. Thomas, and John N. Constantino. 2020. "Implementing Logotherapy in Its Second Half-Century: Incorporating Existential Considerations into Personalized Treatment of Adolescent Depression." *Journal of the American Academy of Child and Adolescent Psychiatry* 59:1012–15.

Bono, Tim. 2018. *When Likes Aren't Enough: A Crash Course in the Science of Happiness*. New York: Grand Central Publishing.

Castelbaum, Lauren, Chad M. Sylvester, Yi Zhang, Qiongru Yu, and John N. Constantino. 2020. "On the Nature of Monozygotic Twin Concordance and Discordance for Autistic Trait Severity: A Quantitative Analysis." *Behavior Genetics* 50:263–72.

Cloninger, C. Robert, Dragan M. Svrakic, and Thomas R. Przybeck. 1993. "A Psychobiological Model of Temperament and Character." *Archives of General Psychiatry* 50:975–90.

Constantino, John N. 1991. *A Poor Man's Proof for the Existence of God*. Mahwah, NJ: Paulist Press.

———. 2001. "A General Theory of Love." *American Journal of Psychiatry* 158:2107.

Constantino, John N., C. Robert Cloninger, Adrian R. Clarke, Bahar Hashemi, and Thomas Przybeck. 2002. "Application of the Seven-Factor Model of Personality to Early Childhood." *Psychiatry Research* 109:229–43.

Dawkins, Richard. 1976. *The Selfish Gene*. Oxford: Oxford University Press.

Dennett, Daniel C. [1984] 2015. *Elbow Room: The Varieties of Free Will Worth Wanting*. Cambridge, MA: MIT Press.

Dinges, William D. 2018. "Our Teens are Leaving the Church. Why?" America: The Jesuit Review. https://www.americamagazine.org/faith/2018/08/28/our-teens-are-leaving-church-why.

Doeselaar, Lotte van, Theo A. Klimstra, Jaap J. A. Denissen, Susan Branje, and Wim Meeus. 2018. "The Role of Identity Commitments in Depressive Symptoms and Stressful Life Events in Adolescence and Young Adulthood." *Developmental Psychology* 54:950–62.

Ferrell, James E. Jr. 2012. "Bistability, Bifurcations, and Waddington's Epigenetic Landscape." *Current Biology* 22:R458–66.

Frankl, Viktor E. [1946] 2006. *Man's Search for Meaning*. Boston: Beacon Press.

Giordano, Umberto. 1896. "La Mamma Morta." *Andrea Chénier* Act 3.

Gray, Nicola Susan, James Knowles, Danielle George, Alex Harvey, Rachel Powell, Mehrnaz Vazirian Zadeh, Carlotta Wansing, and Robert J. Snowden. 2021. "Explicit and Implicit Hopelessness and Self-Injury." *Suicide and Life-Threatening Behavior*. 51(3):606–615. https://doi.org/10.1111/sltb.12743. Online ahead of print.

Hacker, Douglas J. 1994. "An Existential View of Adolescence." *Journal of Early Adolescence* 14:300–27.

James, William. 1910. *The Writings of William James: A Comprehensive Edition*. Edited by John J. McDermott (1978). Chicago: University of Chicago Press.

Kan, Kees-Jan, Dorret I. Boomsma, Conor V. Dolan, and Han L. J. van der Maas. 2012. "Commentary: The Presence of Bifurcations as a 'Third Component of Individual Differences': Implications for Quantitative (Behaviour) Genetics." *International Journal of Epidemiology* 41:346–51.

Kierkegaard, Soren [1844] 1980. *The Concept of Anxiety: A Simple Psychologically Orienting Deliberation on the Dogmatic Issue of Hereditary Sin*. Translated by Reidar Thomte with Albert B. Anderson. Princeton, NJ: Princeton University Press.

Krakauer, John W., Asif A. Ghazanfar, Alex Gomez-Marin, Malcolm A. MacIver, and David Poeppel. 2017. "Neuroscience Needs Behavior: Correcting a Reductionist Bias." *Neuron* 93:480–90.

Kurth, Charlie. 2018. *The Anxious Mind: An Investigation into the Varieties and Virtues of Anxiety*. Cambridge, MA: MIT Press.

Locke, John [1690] 1959. *An Essay Concerning Human Understanding* (A.C. Fraser Edition). New York: Dover.

McNamara, Patrick. 2020. "'Nothing But…' Reductionism Is Not Good Science: Why I As a Neuroscientist Reject Reductionism." *Society of Catholic Scientists*.

https://www.catholicscientists.org/idea/nothing-reductionism-is-not-good-science-why-i-as-a-neuroscientist-reject-reductionism.
Merton, Thomas. [1951] 2002. *The Ascent of Truth*. Boston: Mariner Books.
Mosqueiro, Bruno Paz, Marco Antônio Caldieraro, Mateus Messinger, Felipe Bauer Pinto da Costa, John R. Peteet, and Marcelo P. Fleck. 2021. "Religiosity, Spirituality, Suicide Risk and Remission of Depressive Symptoms: A 6-Month Prospective Study of Tertiary Care Brazilian Patients." *Journal of Affective Disorders* 279:434–42.
New Revised Standard Version Bible. 2007. San Francisco, CA: Harper Collins.
Perry, John. 2010. "Wretched Subterfuge: A Defense of the Compatibilism of Freedom and Natural Causation." *Proceedings and Addresses of the American Philosophical Association* 84:93–113.
Pujadas, Elisabet, and Andrew P. Feinberg. 2012. "Regulated Noise in the Epigenetic Landscape of Development and Disease." *Cell* 148:1123–31.
Schafer, Katherine Musacchio, Grace Kennedy, and Thomas Joiner. 2020. "Hopelessness, Interpersonal, and Emotion Dysregulation Perspectives on Suicidal Ideation: Tests in a Clinical Sample." *Archives of Suicide Research* (December): 1–14. https://doi.org/10.1080/13811118.2020.1859031. Online ahead of print.
Shakespeare, William. [1606] 2021. *Macbeth*. Cambridge, MA: MIT Press. http://shakespeare.mit.edu/macbeth/full.html.
Svrakic, D. M., C. Whitehead, T. R. Przybeck, and C. Robert Cloninger. 1993. "Differential Diagnosis of Personality Disorders by the Seven-Factor Model of Temperament and Character." *Archives of General Psychiatry* 50:991–99.
Tsujii, Noa, Osamu Shirakawa, Atsushi Niwa, Naohiro Yonemoto, Chiaki Kawanishi, Kenji Yamamoto, Tatsuya Sugimoto, and Yoshio Hirayasu. 2020. "Hopelessness is Associated with Repeated Suicidal Behaviors After Discharge in Patients Admitted to Emergency Departments for Attempted Suicide." *Journal of Affective Disorders* 272:170–75.
Viorst, Judith. 1998. *Necessary Losses: The Loves, Illusions, Dependencies, and Impossible Expectations that All of Us Have to Give Up in Order to Grow*. New York: Simon and Schuster.
Waddington, C. H. 1957. *The Strategy of the Genes. A Discussion of Some Aspects of Theoretical Biology*. London: George Allen & Unwin.
Walsch, Neale Donald. 1995. *Conversations with God: An Uncommon Dialogue, Book 1*. New York: G.P. Putnam's Sons.
White, Tonya J. H. 2019. "Brain Development and Stochastic Processes During Prenatal and Early Life: You Can't Lose It if You've Never Had It; But It's Better to Have It and Lose It, Than Never to Have Had It at All." *Journal of the American Academy of Child and Adolescent Psychiatry* 58:1042–50.
Whitman, Walt. [1855] 2005. *Leaves of Grass*. Oxford: Oxford University Press.
Wright, Wendy M. 1988. *Francis de Sales, Jane de Chantal: Letters of Spiritual Direction. Translated by Peronne Marie Thibert*. Mahwah, NJ: Paulist Press.