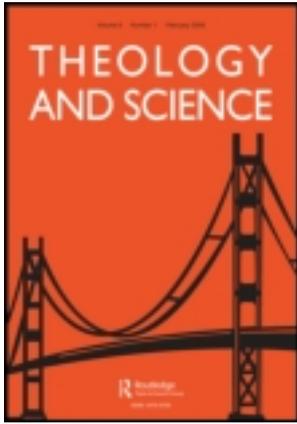


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Evolutionary Perspectives and Transdisciplinary Intersections: A Roadmap to Generative Areas of Overlap in Discussing Human Nature

AGUSTIN FUENTES

Abstract *This essay assesses a subset of approaches to the topic of human nature(s) and endeavors to identify generative areas of overlap for transdisciplinary conversation. Rather than pursue a resolution to the problem of potentially incompatible frameworks across perspectives, I seek to provide a template, or a roadmap, for a better conversation. My conclusions derive from a targeted literature assessment of subareas within the disciplines of philosophy, biology, anthropology, psychology, and theology, emphasizing those open to evolutionary contexts. I highlight eighteen core elements/themes and propose a few central thematic clusters as foci for moving the exchange on human nature between theology and science forward.*

Key words: Human nature; Transdisciplinary; Evolution; Human distinctiveness; Human–animal interface

Opening the 1971 debate between Michel Foucault and Noam Chomsky on “Human Nature,” Dutch philosopher Fons Elders said, “All studies of man, from history to linguistics and psychology, are faced with the question of whether, in the last instance, we are the product of all kinds of external factors, or if, in spite of our differences, we have something we could call a common human nature, by which we can recognize each other as human beings.” In the current historical moment, broad swaths of the American and European public—as well as the American and European academies—are engaging in heated debate concerning what it means to be “human.” Many ask the question: what lies at the core of humanity? The Hobbesian beast prominent in current conservative discourse? The moral and altruistic animal increasingly proposed by some psychologists and animal behaviorists? The suite of adaptations, responding to a mythical Environment of Evolutionary Adaptation, heralded by some evolutionary psychologists? The products of social, political, economic, and historical contexts proposed by some culture theorists?

We could begin and end our discussion with the obvious point that the answer to this question is “none of the above.” But that would get us nowhere. Theologians tell us that humans are made “in the image and likeness of God,” but there are diverse and increasingly integrated debates about what this might mean and how it might relate to conceptualizations of becoming human in the light of

human evolution.¹ While academics would agree that human culture is a cornerstone in the construction of human distinctiveness, increasingly researchers in the biological and social sciences are interested in the ways in which gene-culture coevolution has shaped the human niche.² Across multiple fields there is a broad consensus that our biology interfaces with our behavior and histories in a myriad of complex manners. Today, a diverse array of disciplines envision human agency and culture shaping human biology; but how they describe the interface of biology and culture—especially in light of outcomes such as altruism, and moral reasoning, and how all of this might interact to improve our understanding the world around us and our place in it, our *nature*—can vary in ways that might, or might not, be compatible.

This article presents an overview of specific points of overlap in key scholarly disciplines that approach the topic of human nature(s)³ and suggests that a focus on these overlaps can facilitate more effective transdisciplinary⁴ conversations. This is neither a small nor a simple task. James Proctor⁵ invoked John Godfrey Saxe's telling of the blind men each touching one part of an elephant to describe the quest, across perspectives and disciplines, to elucidate a human nature:

And so these men of Indostan
Disputed loud and long,
Each his own opinion
Exceedingly stiff and strong.
Though each was partly in the right
And all were in the wrong!

In the attempt to identify together thematic foci that are most likely to have some common ground for discourse, I have selected sources from particular subareas within the disciplines of philosophy, biology, anthropology, psychology, and theology that focus on human nature and where the culture-biology interface is a central locus for investigation and evolutionary approaches are considered potential components of the conversation.

In anthropology, the primary areas with this focus are evolutionary and biocultural anthropology (including human behavioral ecology), along with a sampling of social anthropologists whose work also focuses on the possibilities that there is indeed a human nature(s). In biology, it is scholars with specialties in evolutionary theory/evolutionary biology, with a focus primarily on human biology and human evolution. While philosophers have long been the prime investigators of a human nature, or natures, in this endeavor I used both foundational works in Western philosophy focusing on a human nature and selected modern interpretations and perspectives on that same topic. In Psychology it is the range of work in evolutionary psychology over the last few decades and emergent thinking in social psychology that holds the most potential. For theological views, I draw largely on Christian perspectives via foundational treatises (St. Augustine and St. Thomas Aquinas), alongside more recent projects that integrate attempts to compare—and possibly link—theological perspectives to facets of evolutionary contexts.

My attempt here is influenced by van Huyssteen's⁶ proposal of a post-foundational approach that fosters cross-disciplinary conversations featuring intact beliefs and a sharing of the benefits of a human rationality in different modes of reflection, including context, interpreted experience, and tradition. From this approach, one may develop a transversal reasoning⁷ where reason exists at the intersection between disciplines, paradigms and social practices. Such transversality enables one to "unify without appeals to overarching universals and undergirding necessary conditions, neither of which are receptive to temporal passage and changing conditions, be it the successive moments of consciousness or the changing scenes of social practices".⁸ Van Huyssteen's post-foundationalism provides evidence that there is an option of collaboration across diverse disciplines in thinking about human nature(s), and that via a focus on reasoning strategies we can discover permeable boundaries between modes of human thinking.⁹ I follow his lead in an attempt to sidestep the pattern of conflicting disciplines, and attempting to lay out a new playing field, and better roadmap, in challenging thinkers to seek reasons for belief, actions, theory, and opinions that are simultaneously contextually grounded and open to challenge from other reasoning strategies.¹⁰

My goal here is not to answer the question, "What is human nature?" Rather, I seek to compare work in specific areas, or by specific individuals, within these key disciplines that are already attempting to, or ripe for, significant cross-disciplinary engagement. In the vein of Legare and Visala's¹¹ investigation of conceptual resources in psychology and philosophy and their relationship to reconciling natural and supernatural explanations of everyday life, and in the spirit of van Huyssteen's efforts at cross-contextual and interdisciplinary conversations reaching beyond the boundaries of particular epistemic communities,¹² I seek conceptual overlaps and potentially fertile interfaces for integrated discourse on human nature (s). I use the tool of an item-content oriented¹³ targeted literature review, extracting core themes and identifying connecting nodes in order to provide a template, or roadmap, in an attempt to facilitate the dialogue about human nature(s) in a trans-disciplinary context.

Transdisciplinarity as an approach

My impetus to utilize the concept of transdisciplinarity arises from my experiences as a social scientist and research projects in health, ecology, and emerging diseases where such broad-scale approaches have been recognized as core to effective engagement with complex topics.¹⁴ In this arena an emerging consensus suggests that interdisciplinary and multidisciplinary approaches are useful, but limited, in tackling highly integrated or holistic topics, particularly those that have deep roots in positivist or foundationalist traditions.¹⁴

Interdisciplinary approaches focus on the spaces between disciplines and strive to create a relational connection where the collaboration involves incorporating some of the assumptions, worldviews, and potentially, languages of different disciplines.¹⁵ Multidisciplinary approaches, where different actors from distinct

disciplines unite for an investigation, are important sources of data generation, but often lack the integrative framework, or shared “language,” for analyses of those data such that transformation of both disciplinary boundaries and intellectual approaches occurs. With transdisciplinarity there is a goal of developing a relationship that creates a “transcendent language, a metalanguage, in which the terms of all the participant disciplines are, or can be, expressed,”¹⁶ thus facilitating a systems approach and an intellectual transformation that is more thorough, intensive, and generative than in inter- or multidisciplinary approaches.¹⁷

Core factors in a transdisciplinary approach include team-based collaborations, rigor, openness, and tolerance.¹⁸ Rigor, or taking into account as much existing data as is available, acts as a defense against disciplinary biases and distortions. Openness, disciplinary generosity and an acceptance of potential unknowns, creates the space for emergent and unexpected (even unforeseeable) outcomes between team members. Finally, tolerance provides the right for collaborators to hold ideas and truths that may appear opposed to one another.

Transdisciplinarity seeks to transcend disciplinary bounds to synthesize knowledge in the quest to understand the subject of inquiry as a complex dynamic system necessitating diverse disciplinary insights as opposed to an approach highlighting the special focus of any particular field.¹⁹ This is well captured by the historian A.J. McMichael when he points out that “transdisciplinarity is more than the mixing and interbreeding of disciplines. Transdisciplinarity transports us: we then ask different questions, we see further, and we perceive the complex world and its problems with new insights.”²⁰ I contend that in the quest to better understand a human nature, or natures, the dialogue is well served by being couched in such a transdisciplinary approach.

The problem of ultimate explanations

Each of the sets of scholarly publications that make up the focal data for this endeavor has a vested interest in thinking about being and becoming human. However, given the varying histories, vocabularies and intellectual arcs of practitioners in anthropology, biology, philosophy, psychology and theology, one might be hard pressed to find common ground between them. This overview (and previous related endeavors²¹) suggests that the search for common ground on human nature(s), or at least a suite of shared themes for discussion, is tenable and that a successful outcome of such a process could contribute in a positive manner to enhancing knowledge and theoretical possibilities surrounding explorations of what makes us human.

One pattern of significant distinction in the core scholarly foci of the literature reviewed for this project lies in what is often referred to as “ultimate” explanations. Ultimate accounts are the central or definitive constructs that act as the fundamental explanatory framework under which scholars organize their quest for understanding humanity. There is an array of potentially discordant ultimate constructs across anthropology, biology, philosophy, psychology and theology.

For theologians their faith, experienced through the word of God, creates a teleological context for humanity. In a sense one knows the truth but it is the search to better understand the answer, to discover the depth and meaning of *Imago Dei* that drives the theologian to ask about the processes in being and becoming human. This is a basal account of humanity that is not shared by many (most?) biologists and social scientists, some even see it as a mutually exclusive ultimate accounting relative to social and evolutionary theories. However, recently some theologians, and some social scientists, have been actively thinking about how human evolutionary histories affect and interact with theological perspectives and how to integrate a shared view of humanity via evolutionary and theological accounts opening up a space for potential consilience.²²

For biologists (and many evolution-oriented anthropologists and psychologists), the ultimate context is that of evolutionary function. As noted by Kevin Laland and colleagues,²³ the biologist Ernst Mayr laid a core infrastructural baseline for biological approaches by distinguishing between proximate and ultimate causes in understanding traits and behaviors of organisms.²⁴ For Mayr (and nearly all biologists since), the proximate cause is the immediate, contextual influence on a trait or behavior. For example, in the case of bird migration it would be the influence of day length on the concentration of a hormone in a bird's brain. Under this rubric ultimate causes are evolutionarily causal, and thus historical, explanations. The ultimate cause explains *why* (in an evolutionary sense) an organism displays one trait or behavior rather than another. Natural selection is almost always invoked as the cause and the architect in the ultimate explanation, and seeking a human nature implies seeking to understand the evolutionary outcomes of selection pressures across human history and the human experience.

For many anthropologists (especially those included in this analysis), Mayr's proximate/ultimate perspective, and its primacy of natural selection, holds true. However, some anthropologists (particularly those specializing in social/cultural anthropologies) hold to a view that humans are ubiquitously cultural creatures and that this mandatory "encultured" reality creates a context in which we must look to one's enculturation and life experience as it interfaces with the body and mind to ultimately explain why humans do what they do.²⁵ It is also worth noting that many anthropologists would suggest that there is no fixed "human nature," but rather a process as humans *become themselves*, that stands in for an ultimate answer.²⁶

For evolutionary psychologists Mayr's ultimate explanation is the central driver in their endeavors. Most see ultimate explanations as pointing to a suite of modules fixed (via natural selection) in the mind.²⁷ In a less strident version, psychologists see the ultimate explanations for human behavior and perceptions as dealing with the structure and function of the mind (which may or may not be more than the brain) as it has been shaped over evolutionary time and via human social experience.²⁸

For philosophers, there is a wide array of final answers. Classical and traditional approaches seem to coalesce around the notion of rationality as humans' distinguishing, and ultimately unique, feature. It is with some of the more recent

philosophers of biology that we see a challenging of both the positioning of humans as the only rational beings and a challenge to the static notion of Mayr's proximate/ultimate dichotomy.²⁹

Despite the commonality of there being some referent to evolutionary context across the sources in this review, there is a significant amount of discord between the ultimate contexts utilized. However, this problem of discord can be somewhat ameliorated by engaging recent work that challenges the boundaries between proximate and ultimate answers and opens up a space for possible synergies for those scholars with intellectually generous aspirations.

In the field of evolutionary theory and philosophy of biology, two recent publications present a substantive and eloquent account challenging the strength of the boundary between proximate and ultimate evolutionary explanations.³⁰ Laland and colleagues very effectively argue that the proximate/ultimate dichotomy fails as a heuristic framework for understanding evolutionary change and that it reduces communication between researchers of different backgrounds. They argue that to fully integrate evolutionary biology with developmental biology, ecology, and the human sciences, requires a different way of thinking about evolutionary causation: "one that no longer treats ecological and developmental environments as context, that explicitly recognizes organisms as part constructors of environmental states, and that views such construction, and its legacy over time, as evolutionary processes in their own right."³¹

By arguing for a dynamism between contingent aspects of organisms, ecologies and evolutionary histories, Laland and colleagues open a theoretical space, and provide a semantic and heuristic landscape, that, potentially, invites both flexibility in the conceptualization of explanatory structures and provides the possibility of multiple perspectives on being human to take seats at the same at the intellectual table.

A similar challenge to classic theological approaches is also underway. Work by Celia Deanne-Drummond, Nancey Murphy and Warren Brown, Malcom Jeeves, and J. Wentzel van Huyssteen³² explicitly describes theoretical locales that include diverse evolutionary, social-scientific, and theological perspectives engaging in deep scholarly exchange. Moving beyond the simple communication of concepts across disciplinary divides, these undertakings are attempting to provide synergies of theoretical and practical approaches in theology and the sciences to the study of humanity.³³

Finally, in the field of anthropology, there is a strong move towards an integrative approach to human becomings. Melding biological, social, and symbolic foci of study, this biosocial approach is in the early stages of generating a suite of perspectives that are simultaneously open to diverse disciplinary inputs to the study of humankind and to our relations to other beings.³⁴ This movement places anthropological inquiry as a discipline in a potentially overlapping sphere with a few modern approaches in theological anthropology.³⁵

The problem of incompatible ultimate explanatory frameworks is a concern in this overall endeavor but appears to be being sufficiently challenged across a number of the disciplines such as to make synergistic actions more feasible. It is my hope that this article contributes to that trend.

Searching for a better conversation

The aim of this article is not to generate a resolution to the problems of incompatible frameworks across perspectives; rather, I seek to provide a guide to thematic locales where practitioners in anthropology, biology, psychology, philosophy and theology can find fertile common ground upon which to engage one another.

To identify these locales of potential engagement, I targeted published literature from the disciplines of interest with a focus on human nature and including the particular emphases noted earlier.³⁶ Appendix 1 lists the main sources utilized in this review. From these sources, using an item-content oriented approach, I extracted a suite of core elements that reflect, in my opinion, both the most prominent relevant themes in the items reviewed and the best locales for transdisciplinary interfaces. I term these perspective/thematic summaries “core elements” and list them with descriptions below.

To be classified as a core element, the theme/concept had to appear in at least fifty per cent of sources examined in one discipline or occur in at least twenty per cent of all sources examined across disciplines. These are somewhat arbitrary distinctions, but the cut-off points do represent a sufficiently common and thus potentially important dividing line between recurrent, structural thematic elements and peripheral idiosyncratic concepts. The core elements do not necessarily reflect the central propositions in the published material, nor do I profess to have fully captured the complexity of each perspective. Rather, as noted above, these are the most common and pervasive elements that are also the most likely candidates as loci for serious mutual engagement across disciplines.

I am aware that there is a significant bias in sources that I have used to identify the key areas for potential shared engagement, and I make no claim to have created an exhaustive list of the various perspectives in these literatures. However, the selections that I have chosen all have orientations open to interfaces between some aspect or version of evolutionary theory and their source discipline; and many are already interdisciplinary in practice, thus logical loci for the investigation. Sources that intentionally deny/negate such possibilities, such as some variants of fundamentalist Christian theology or purely humanistic anthropology were not considered. Also, perspectives that hold that there is absolutely no possibility of accessing or describing/seeking/understanding something we can term “human nature(s)” are not included. Obviously, the caveat regarding openness to evolutionary theory does not include basal theological and philosophical perspectives that emerged prior to the codification of Darwinian evolution and modern evolutionary theory.

The brief descriptions of these core elements that follow are generalized and in many cases multiple definitions could be associated with the terms used. The elements are derived from the literature sources identified in Appendix 1 and thus may not reflect other interpretations from other sources (see, for example, *Imago Dei* below). Each of these elements can be expanded on, contextualized, and linked to broader or more diverse interpretations as dialogues mature, but their current incarnation is meant as a starting point for the transdisciplinary approach suggested above. I have crafted these definitions to best represent

summaries of themes and their usage in the source materials consulted. I have also attempted to use basic language in these descriptions, avoiding as much disciplinary jargon as possible.

Eighteen core elements

The eighteen core elements are derived from assessments of selected sources in anthropology, biology, philosophy, psychology, and theology in Appendix 1.

Personhood/consciousness/mind. This reflects the assertion that humans have an active consciousness of self, an awareness of one's self as a being with thoughts, sensations, and a corporeal and mental presence, and that this is a core facet of human nature. This includes the recognition of similar awareness (selves) in others and the ability to "mind read" or identify (or identify with) the state of mind, intentions and perspectives of others. For some psychologists, biologists and philosophers this is referred to as *Theory of Mind* (TOM). This general element also appears in two distinct forms in the literature (*rational mind* and *rational animal*).

Rational mind. This is the assertion that a core facet of human nature is that the human mind is rational in a way not present in other animals on the planet (we are different in kind, not degree): we have the ability to reason, contextualize, plan, interpret and logically analyze situations and scenarios and thus are different from all other life on this planet in our ability to do this. This element is a subset of *Personhood/consciousness/mind*, in that it specifically denies continuity in gradation of TOM or personhood across organisms.

Rational animal. As with the above, this asserts that a core facet of human nature is that the human mind is rational in a manner distinctive from the mental capabilities of other animals on the planet; however, this element is distinct from *rational mind* in that there is an explicit recognition that we are linked to the animal world and although our extensive ability to reason sets us apart we share other deep continuities.

Free will. Humans, unlike other beings on the planet, have the ability to make choices free of the constraints of tethers (biological or otherwise). As rational agents, humans have the ability to choose how to be; and this is a core facet of human nature. When invoked, this element is always linked with *Personhood/consciousness/mind*, but many use *Personhood/consciousness/mind* without invoking free will. This perspective is primarily found in the philosophical and theological perspectives, and more recently in some from psychology.

Human animal/continuity with other life. This theme is closely aligned with *Evolutionary lineage* (below); it is the basic understanding that humans are part of the organic world and that we share evolutionary links, a form of biological kinship, to other forms of life on earth. Humans are a type of biological being, classified as "animal" (part of the kingdom *Animalia*). This also assumes that humans are not a unique kind of being relative to other animals, but does leave open the possibility that there are core aspects of human beings that distinguish them for other organisms.

Human as cultural animal/biosocial being. In the most complete version, this assumes that human nature is the result of enmeshed cultural, social, and biological contexts and not divisible into a biological self and a cultural self. There is the assumption that becoming and being human is always done via enculturation, such that human nature reflects an ongoing synergistic state of simultaneous biology and social context. Humans are born into cultures and local ecologies and those contexts intertwine with biological aspects to co-shape the ways in which the human develops and “is” over the lifespan (not in a simple additive modality of biology + culture, or genetics + environment). This is most often found in anthropological and biological perspectives, occasionally present in psychological and a few philosophical perspectives. In a more basal version, that occurs in some philosophy and theology, this represents the notion that a full human nature can only be truly achieved in community, by growing up with, and engaged in human social/cultural/spiritual contexts.

Relation with God/Imago Dei. The view that human nature is best represented by a fuller understanding of the book of Genesis, especially 1:26–30, “So God created humanity in his own image, in the image of God he created them; male and female he created them. And God blessed them, and said to them, “Be fruitful and multiply, and fill the earth and subdue it. Have dominion over the fish of the sea, the birds of the air, and over every living thing that moves of the earth.”³⁷ Here, human nature is best understood or explored via the relationship with God and all that it entails. This perspective resounds most prominently in theological views, but some psychologists and philosophers who hold robust Christian beliefs also incorporate this into their views.

Evolutionary lineage. This is a broad element which assumes that any conglomerate of traits, states, or behaviors that we might term a “human nature” is the result of our evolutionary lineage; an outcome of the various suites of adaptive complexes that characterize humans and their ancestors. This element is shared across many of the perspectives I examined due to the selective criteria (a pro-evolutionary bias) I used in collecting the literature for review. However, this is different from the general criteria I used in choosing sources (being open to an evolutionary context or using evolutionary approaches) in that it has an explanatory focus on the role of the evolutionary lineage as the key context in which to articulate and investigate a human nature.

Priority of role of natural selection. In a subset of *Evolutionary lineage*, common amongst evolutionary psychologists and some biologists and anthropologists, where human nature is seen as resulting from natural (and sexual) selection pressures only. This is a strict neo-Darwinian view.³⁸

Soul/Mind–Body dualism. Emerging from some traditional philosophical views, epitomized by Platonic and Cartesian perspectives, this element sees humans as having a material body and a non-material soul (or mind). The seat of a human nature is the mind/soul and not the body. Here, rationality and spirituality are properties of the soul, uniquely human, and the body is material that can be seen as shared with the organic world.

More than the material: neither dualistic nor reducible. Also recently referred to as *Non-reductive physicalism*,³⁹ this element appears with increasing frequency in

some philosophical and psychological perspectives in close dialogue with certain theological and evolutionary views. This is the proposal that human nature cannot be differentiated into a soul/mind–body duality; rather, human nature is the totality of the human being, biology, culture, behavior, experience, etc... And yet, the final product (the human, and the totality of our nature) is greater than the sum of the parts and not wholly reducible into categorical constituent components.

Interaction with and construction of natural world/ecologies. Here, human nature is seen in our species via the constant interactions, construction, destruction, engagement, and entanglement with our social and structural ecologies. Humans are always born into such ecologies and they always add to them/alter them/interface with them, such that this state of being is the natural one for humanity. This is seen in recent work by biologists and some anthropologists.⁴⁰

Behavioral universals. Stemming from some views in anthropology and psychology, this element sees human nature as that set of behavioral patterns that are found across all human societies.

Community/ultrasociality/reciprocity. Recent work in game theory, primatology and anthropology leads some biologists and anthropologists to see human nature as our ultrasocial, hyper-reciprocal, super-cooperating manner of being... such behavior is inherent in being human as a default, a pattern not found (to the same extreme extent) in other organisms.

Morality/moral animals. Some philosophers and theologians see in a human nature the capacity to behave morally, to know right and wrong, and to have visceral and intellectual responses to that knowledge; they argue that this sets us apart for other life on the planet. Simultaneously, research on humans and other primates (and social mammals) leads some psychologists and biologists to state that this can also mean that while humans are the only fully moral creatures the roots of morality are present in other animals.

Distinctive/unique human traits. This is the view that human nature can be defined as the set of behavioral and perceptual traits found only in our species (such as language, symbol, religion, etc.).

Propensity towards religious belief. This element posits that it is human nature to engage with the spiritual; a faith in meaning and presence of more than the material world is a natural part of being human. This is often associated either with a relationship between TOM and the tendency to use intentional agents to explain the existence of order (functionalist/natural selectionist view of some anthropologists, biologists, and psychologists) or a perspective wherein evolutionary patterns are indicators and the result of a God's influence (a generalized form of natural theology).

Special capacity to enter into relationships. Here, human nature is that which enables humans to enter into more complex, diverse, symbolic, reciprocal, and spiritual relationships with others in a way not available to other forms of life. This is an outcome of, or related to, the elements *Community ultrasociality/reciprocity*, *Human as cultural animal/biosocial being*, *Imago Dei*, and *Personhood/consciousness/mind*.

How does thinking with these elements get us closer to a transdisciplinary discourse on human nature?

The relative frequency that these core elements appear across the sources examined provides the initial context for thinking about their potential as loci for transdisciplinary discourse (Figure 1). Four of them stand out from the rest: *Evolutionary lineage*, *Human animal/continuity with other life*, *Human as cultural animal/biosocial being*, and *Distinctive/unique human traits*. These then, are the principal core elements to examine regarding their potential as loci for enhanced, and transdisciplinary, discussion. Given my criteria, *Evolutionary lineage* is to be expected as a majority common theme and is already a robust point for multiple disciplines to gather around for attempts to examine human nature(s).⁴¹ However, the other three deserve closer examination.

Human animal/continuity with other life is closely aligned with *Evolutionary lineage* and is a logical expectation if one holds the view that evolutionary processes are a central factor when thinking about life on the planet (including humans). Thus biologists, many anthropologists, evolutionary psychologists and philosophers of biology could, relatively easily, engage with one another on this theme (and increasingly do⁴²). However, the *continuity with other life* theme also emerges from some theological perspectives that envision humans and other life forms in a broader relationship with the divine.⁴³ This broad, relational conceptualization of *Imago Dei* places humans in relationship with broader context of life on earth as a central component of their relationship to the divine. This element provides

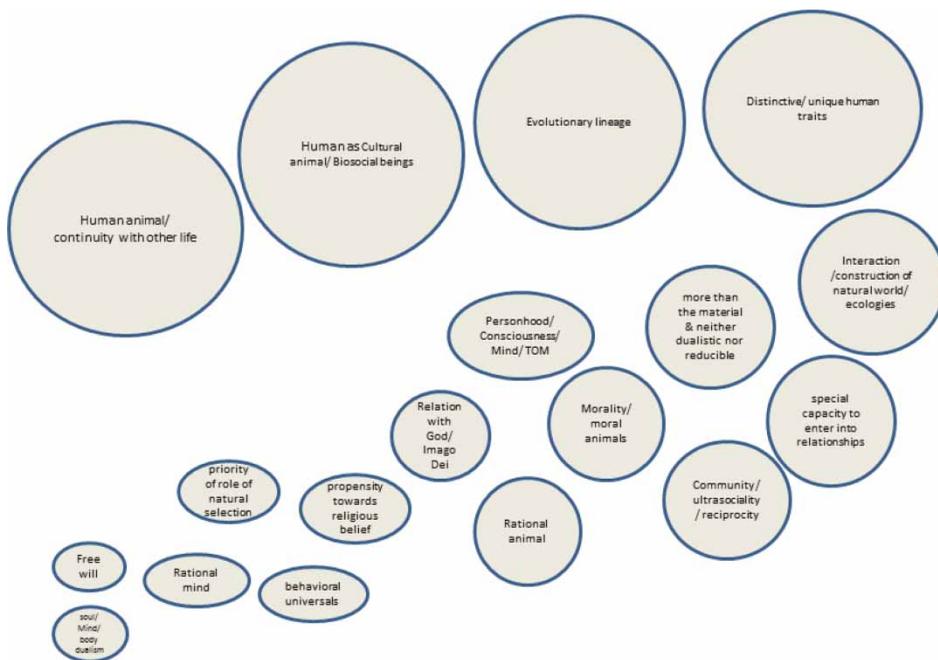


Figure 1 Relative frequencies for core elements across sources used. Oval size reflects frequency and intensity of occurrence across entire data set

a space for theology and the sciences to think together about humans in continuity, and relationships, with animals, with each other.

Human as cultural animal/biosocial being is centrally located in anthropological and some biological discourse.⁴⁴ The core role of culture and processes of enculturation as a requirement for human development is a common theme ranging across all of anthropology and into current biological and psychological views that emphasize gene–culture coevolution and niche construction.⁴⁵ However, it also occurs in a more general sense in some philosophical and theological literature where developing as a human is achieved by living in, and being part of, the human community. Here, communion with social/cultural contexts is seen as the central requirement to fully develop as a human being. If one considers this in dialogue with *Evolutionary lineage*, then it too becomes a very likely place for multiple disciplines to converge and be able to employ overlapping ideas working towards more synergistic conceptualizations involving processes implicated in being human (as is evident in the work of Malcolm Jeeves and also J. Wentzel van Huyssteen⁴⁶).

The idea that *Distinctive/unique human traits* are central facets (and drivers) when thinking about investigating human nature(s) is common to all the perspectives reviewed. However, the emphases on which traits are of interest and the differential stress on “distinctive” versus “unique” across the disciplines create some substantive challenges. In an evolutionary sense, “distinctive” may be a better term than “unique.”⁴⁷ While most evolutionary approaches focus on the continuities generated by evolutionary processes (such as *Evolutionary lineage* and *Human animal/continuity with other life*, above), these processes also generate significant discontinuities between forms. Evolution is a process of diversification in lineages and the branching pattern is often, in effect, caused by core functional distinctions.⁴⁸ These distinctions are derived from the modification (sometimes radical modification) of shared patterns or traits in related lineages. These distinctions are not created *de novo*, even though their form and function might be serving a very different function or operating on a very distinct scale than in related forms.⁴⁹

However, if one considers humans to have truly unique traits (only species capable of rational thought and/or a theory of mind), then we run the risk of underplaying, or discounting, the biological continuities inherent in the evolutionary processes. This is the potential cleaving point between philosophers, theologians and highly humanistic anthropologists on one hand with other anthropologists, biologists and many psychologists on the other. There is the possibility to move past this unique/distinctive quandary,⁵⁰ but it is not easy and can pose a potential obstacle to transdisciplinary discourse on the topic.

In Figure 1, the remaining fourteen elements’ respective frequencies in the sources are reflected by their relative size. They fall into a three-part spectrum with the concepts *Morality/moral animals*, *Capacity to enter into special relationships*, *Community/ultrasociality/reciprocity*, *Interaction/construction of natural world/ecologies*, and *More than the material/neither dualistic nor reducible* making up the second tier most common elements. *Personhood/consciousness/TOM*, *Rational animal* and *Relationship with God/Imago Dei* make up the third tier; and the fourth cluster, and least pervasive end of the spectrum, is made up of *Propensity towards religious*

belief, Behavioral universals, Rational mind, Priority for natural selection, Free will, and Soul/mind–body dualism.

The eight elements in tiers 2 and 3 have some potential to foster dialogue. I suggest that *Capacity to enter into special relationships* and *Community/ultrasociality/reciprocity* are particularly fertile areas for interdisciplinary interactions. Recent work in neurobiology⁵¹ opens important doorways to synergies between different disciplines to thinking about what social relationships mean and how these might be approached in collaborative research projects involving biological, social-scientific, philosophical and even theological perspectives.⁵²

The elements in the fourth tier, on their own, provide little hope as loci for effective transdisciplinary engagement as each is rooted in single, or possibly two, disciplines and either largely absent from, or substantially discordant with, the other disciplines (at least in my sample). The only real exception here is *priority for natural selection*. In large part, this being in the least common cluster is due to recent changes in evolutionary theory that have added complexity to thinking about evolutionary processes and, while not fully deprioritizing natural selection, have contextualized it within a diverse array of other processes. This is especially common in recent thinking about human evolution.⁵³ *Propensity towards religious belief* might also be an area of potential interface, especially given the recent expansion in anthropological and psychological interest in the “evolution” of religions.⁵⁴

Prime locations on the road map

To generate an itinerary for moving transdisciplinary dialogue forward, I propose that we can visualize the suite of relationships between the core elements as a roadmap in order to generate focal clusters as map points that lend themselves to mutual, and generative, engagement via multiple disciplines. Thinking of the four most prominent core elements as central map points with a relational gravitational pull on the other elements enables us to move to the next step in laying out a basis for dialogue, and research projects. Figure 2 shows the clustering relationships between the four most prominent elements and the other fourteen.⁵⁵

This visualization suggests that the cluster surrounding *Human distinctiveness* and *Humans as cultural animals/biosocial beings* is likely a highly fruitful arena. Especially in the interstitial spaces between *Human distinctiveness* and *Humans as biosocial beings* as that relates to human relationships, *Personhood/TOM*, and even the implications of a *Human propensity for religious belief*. This resonates with the notion that it is the discontinuities in evolutionary trajectories that has the greatest potential to bring multiple disciplines to the table. It should come as no surprise that such a focus on the human is the logical locale to unite the biological and social sciences with the more humanistic philosophy and theology.

Current inter- and multidisciplinary examples of exactly these types of undertaking can be found in the recent edited volume by Malcolm Jeeves⁵⁶ and the ongoing (2012–2013) joint project by the Center of Theological Inquiry (CTI) and the John Templeton Foundation (the “Inquiry on Evolution and Human Nature”) that

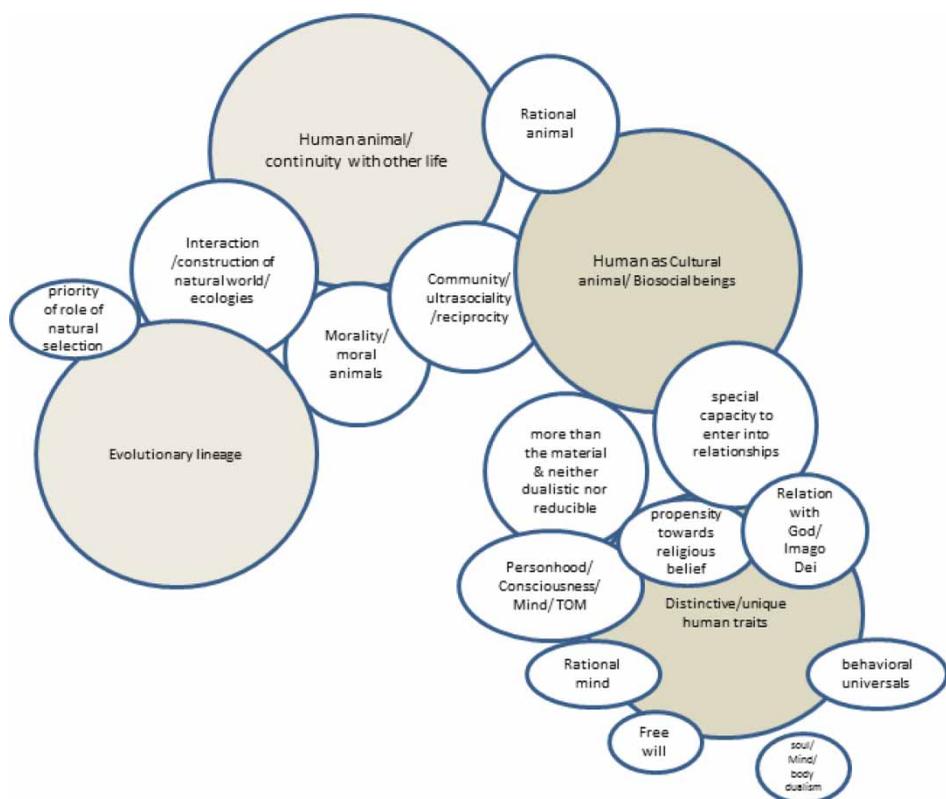


Figure 2 Associations among core elements. Spatial relationships depicted here represent affiliations in the data sources and potential for engagement between core elements

unites anthropologists, biologists, philosophers and theologians.⁵⁷ The recent volume edited by Jeeves, while robustly interdisciplinary with generous contributions from anthropology, biology, psychology, history, and theology, remains a collection of disciplinary perspectives united by a sincere agreement that theistic and scientific approaches can be complementary. However, it is not clear that any shifting of disciplinary boundaries, or a mutability of the different reasoning strategies, results from the book.⁵⁸ The project at the CTI is underway and, while emphatically inter- and cross-disciplinary in its discourse, has not yet produced sufficient outcomes to assess the transdisciplinarity of the endeavor.

The broader interactions between basal evolutionary ideologies, human continuity with other life, humans as cultural animals and those patterns of continuity and discontinuity in the human lineage are probably the most important overarching questions at hand, and represent an approach that sits well in the central arenas of interest for many disciplines. And it is in describing and investigating these relationships that larger and more comprehensive transdisciplinary outcomes might appear. For example, the increasing theological engagement with other scientists on the context and meaning of becoming human by necessity will center around the themes highlighted here and has already been having some success in evoking transdisciplinary responses.⁵⁹

A focus on discontinuities does not diminish the continuity aspects of evolutionary perspectives and the relationships between humans and other animals. In fact, I suggest that the human–animal/human–ecology interface is the second most promising area for transdisciplinary action. Work by theologians on *Imago Dei* and humans' relations with other life⁶⁰ and anthropologists and biologists work with humans, other animals, and the potential for the deep roots of social justice⁶¹ laying promising groundwork for such endeavors. This nexus appears to forge a link between evolutionary emphases on the role of humans with other animals, the possibilities of image-making and being in the world, and the concepts and impacts of a deep morality.

Despite the recent work challenging the validity of ultimate explanatory frameworks in each of the core disciplines of interest (anthropology, biology, philosophy, psychology, and theology), the problem of incompatible ultimate explanatory frameworks remains a major stumbling-block to transdisciplinary work. The two areas I highlight here (the interstitial spaces between human distinctiveness and humans as biosocial beings, and the human–animal/human–ecology interface) can be central foci that provide intellectual space to circumnavigate these conflicts. If the participants from different disciplines remain generous in their theoretical approach, open to diverse perspectives and searching for overlaps while not abandoning their core interests and analytic toolkit, then I am convinced that these areas can provide fruitful landscapes or discovering novel (or at least innovative) ways to think about human nature(s).

Optimism and interdisciplinary reality on interfaces between theology and the sciences

At the outset of this article, I stated that the disciplines most likely to have some common ground for discourse surrounding human nature(s) are subareas within philosophy, biology, anthropology, psychology, and theology where evolutionary contexts are central, or at least substantive, aspects of the inquiry. My review of the literature and extraction and comparison of core elements bears this out. It is indeed possible to have a transdisciplinary discussion on this topic.⁶² However, initiating and maintaining such discussion is neither easy nor simple: the participants have to be flexible in the boundaries of discourse, and realize that full agreement is not the sought-after outcome (as per “tolerance” in the section on transdisciplinarity above).

The collected essays in the volumes edited by Jeeves and Brown et al.⁶³ do provide a context for a generous cross-disciplinary approach, and the chapters by individuals from different disciplines show evidence of mutual influence (such as evolutionary perspectives influencing theological narratives, theistic perspectives shaping the language of psychologists and biologists). But there remains an adherence to the classic humanities research structure where each scholar creates an individual contribution, and although influenced by others, remains rooted firmly in the reasoning strategy of their own home discipline. In the case of van Huyssteen's opus, *Alone in the World*, we do see a sincere

attempt to do more than borrow data and terminology from human evolutionary studies. There is the creation of a novel theological narrative, an innovative reasoning strategy, that is in part the result of a true transformation due to these influences. This does approach a transdisciplinary undertaking by an individual scholar; however, it is not clear that the contribution has been bi-directional and that other narratives (in paleoanthropology/human evolution, for example) have also been influenced by the resultant narrative/perspective. What I am suggesting as a possibility here is a slightly different research paradigm—one that involves teams of actors focusing on the most fertile core topics and attempting transdisciplinarity as a process with an influential directionality that mutually mixes and crosses between and through disciplinary demarcations.

To accomplish this, we need to consider the differences between transdisciplinary and interdisciplinary and be ready to think about human nature(s) as opposed to human nature as a singular or monolithic entity. To paraphrase many of the individuals who I have spoken with in this area, it is not so important that there is a specific or monolithic answer to the question “What is human nature?,” but rather the focus of a transdisciplinary discourse should be on the way we go about talking and thinking about it. I suggest that attention to potentially highly fruitful locales that are already topics of interactions, such as those I highlight above, are where we should redouble our concentrated effort for dialogue between theology and the sciences.

However, there is one core factor related to the problem of different ultimate explanations between theology and the other disciplines that remains a stumbling-block in many cases. Many (most?) anthropologists, biologists, psychologists and even many philosophers are to some degree antagonistic at worst, and agnostic at best, towards attempts to bring theology to the table in discussions about what it means to be human. The primary problem is with the common perception of the teleological nature of creation narratives and the assumption by many scientists that there is little room in a view that prioritizes the relationship with the divine (*Imago Dei*) for the naturalistic, and largely non-teleological assumptions that permeate biological and social scientific paradigms. This is not a new discussion, nor is it one that reflects the entirety of the theological or biological and social-scientific perspectives accurately.⁶⁴ However, it is one that emerges frequently in both informal and formal contexts.

Adding my voice to this dialogue, I propose that if we ask “Can theology play a role in these discussions?” in the light of my assessment of the literature and analyses of the core elements above, then we must be open to the possibility that the answer is “Yes.” Theological engagement with integrative and relational envisioning of *Imago Dei* and aspects of Natural Law⁶⁵ promotes openness and a perspective that seeks to enable landscapes of interaction between evolutionary and theological narratives.

In my opinion, one of the main roadblocks in getting a full suite of disciplines to the table is the lack of sincerely reading across areas and reasoning strategies... a substantial percentage of the researchers thinking about being human and human nature(s) do not engage with the range of literature covered in the review here or available in recent interdisciplinary volumes. I believe that a lack

of exposure to what is actually being said across disciplines remains a major obstacle to effective discourse on this subject. Interaction between all of the disciplines of interest can facilitate a move beyond incompatible ultimate explanations towards ongoing, and transdisciplinary, discourse about possible theoretical and intellectual concordances.⁶⁶

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Endnotes

- 1 See Celia Deane-Drummond and Paul Watson, "Becoming Human in Theistic Perspective," *Zygon* 47:4 (2012) and also J. Wentzel van Huyssteen, *Alone in the World? Human Uniqueness in Science and Theology* (Grand Rapids, MI: Eerdmans, 2006).
- 2 Jon Marks, "The Biological Myth of Human Evolution," *Contemporary Social Science* 7:2 (2012): 139–157; Michael O'Brien and Kevin N Laland Kevin "Genes, Culture and Agriculture: An Example of Human Niche Construction," *Current Anthropology* 53:4 (2012): 434–470.
- 3 I use the potential plural "(s)" here to indicate that neither I nor many of the researchers whose work I am using assume that a human nature is necessarily a single entity or that there are not multiple variants involved in becoming and being human.
- 4 In this case, I am using "transdisciplinary" to describe a more holistic, team-based, and genuinely integrative approach, where theoretical perspectives are open to the possibility of significant fluidity in boundaries and a degree of mutual malleability. This also implies the possibility that insight from across disciplines can substantively influence the shape and coherence of each other's theoretical and methodological toolkits. This is opposed to "interdisciplinary," which is more of a particulate exchange of components or the creation of a composite of analytical methods from different perspectives rather than something that alters shape and content of one another's actual perspectives. See section on transdisciplinarity.
- 5 James Proctor, "Resolving Multiple Visions of Nature, Science, and Religion," *Zygon* 39:3 (2004): 637–658.
- 6 J. Wentzel van Huyssteen, *Alone in the World?* and *The Shaping of Rationality: Toward Interdisciplinarity in Theology and Science* (Grand Rapids, MI: Eerdmans, 1999).
- 7 Calvin O. Schrag, "Traces of Rationality: Acknowledgment, Recognition, and Repetition," in *The Evolution of Rationality*, ed. F.L. Shults (Grand Rapids, MI: Eerdmans, 2006), 19 – 29.
- 8 *Ibid.*, 28; see also Sung Kyu Park, "A Postfoundationalist Research Paradigm of Practical Theology," *HTS Theologische Studies/Theological Studies* 66:2 (2010), art. #849, 6 pages. DOI: 10.4102/hts.v66i2.849.
- 9 Erin Green, "A Primer in Interdisciplinarity: J. Wentzel van Huyssteen and the Post-foundational Approach," *Toronto Journal of Theology* 27:1 (2010): 27–36.

- 10 Ibid.
- 11 Cristine H. Legare and Aku Visala, "Between Religion and Science: Integrating Psychological and Philosophical Accounts of Explanatory Coexistence," *Human Development* 54 (2011): 169–184.
- 12 Sung Kyu Park, "A Postfoundationalist Research Paradigm of Practical Theology," *HTS Theologische Studien/Theological Studies* 66:2 (2010): Art. #849, 6 pages. DOI: 10.4102/hts.v66i2.849; J. Wentzel van Huyssteen, *Shaping of Rationality*.
- 13 This is a review process that focuses on specific comparable content from diverse published sources/disciplines. Potential shared elements/contents are those that utilize identifiably similar themes, objectives, descriptors or definitional aspects. These aspects are then analyzed for intent and content and extracted and summarized for comparison.
- 14 Gertrude H. Hadorn, Susette Biber-Klemm, Walter Grossenbacher-Mansuy, Holger Hoffmann-Riem, Dominique Joye, Christian Pohl, Ues Wiesmann, and Elizabeth Zemp, "The Emergence of Transdisciplinarity as a Form of Research," in *Handbook of Transdisciplinary Research*, ed. G.H. Hadorn et al. (Zurich: Springer, 2008), 19–42.
- 15 Frank Kessel and Patricia L. Rosenfeld, "Toward Transdisciplinary Research Historical and Contemporary Perspectives," *American Journal of Preventive Medicine* 35:2S (2008): S225–S234.
- 16 Gavan J. McDonnell, "Disciplines as Cultures: Towards Reflection and Understanding. Transdisciplinarity," in *Recreating Integrated Knowledge*, ed. M.A. Somerville and D. Rapport (Oxford: EOLSS, 2000), 25–38 (quote on page 27).
- 17 Hadorn et al., "Transdisciplinarity as a Form of Research."
- 18 Kessel and Rosenfeld, "Historical and Contemporary Perspectives."
- 19 Ibid.
- 20 Anthony J. McMichael, "Assessing the Success or Failure of Transdisciplinarity," in Somerville and Rapport, *Transdisciplinarity*, 218–222 (quote on page 220).
- 21 Warren Brown, Nancey Murphy, and H. Newton Malony, *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature* (Minneapolis: Fortress, 1998); Malcolm Jeeves, ed., *Rethinking Human Nature: A Multidisciplinary Approach* (Cambridge: William B. Eerdmans, 2011).
- 22 See for example Celia Deane-Drummond, "God's Image and Likeness in Humans and Other animals: Performativity Soul-making and Graced Nature," *Zygon* 47:4 (2012): 934–948; Deane-Drummond and Watson, "Becoming Human"; J. Wentzel van Huyssteen, *Alone in the World?*; and Jeeves, *Rethinking Human Nature*.
- 23 Kevin N. Laland, Kim Sterelny, F. John Odling-Smee, William Hoppitt, and Tobias Uller, "Cause and Effect in Biology Revisited: Is Mayr's Proximate–Ultimate Dichotomy Still Useful?" *Science* 334 (2011): 1512–1516; Kevin N. Laland, F. John Odling-Smee, William Hoppitt, and Tobias Uller, "More on How and Why: Cause and Effect in Biology Revisited," *Biology and Philosophy* (2012): DOI 10.1007/s10539-012-9335-1.
- 24 Ernst Mayr, "Cause and Effect in Biology," *Science* 134 (1961): 1501–1506.
- 25 Jon Marks, "Biological Myth."
- 26 See discussion in Timothy Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (London: Routledge, 2000).
- 27 Jerome H Barkow, Leda Cosmides, and John Tooby, eds., *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (New York: Oxford University, 1992).
- 28 Louise Barrett, Robin Dunbar, and John Lycett, *Human Evolutionary Psychology* (Princeton, NJ: Princeton University Press, 2002).
- 29 Kim Sterelny, *The Evolved Apprentice: How Evolution Made Humans Unique* (Boston: MIT Press, 2012).
- 30 Ibid., 23.
- 31 Ibid., 23.
- 32 Deane-Drummond, "God's Image and Likeness"; Brown et al., *Whatever Happened to the Soul?*; Jeeves, "Rethinking Human Nature"; and van Huyssteen, *Alone in the World?*

- 33 Here I consider Deane-Drummond's and van Huyssteen's recent efforts and the most recent volume edited by Jeeves (2011) as robust evidence that cross-contextual and interdisciplinary conversations reaching beyond the boundaries of particular epistemic communities are not only possible, but ongoing in theological circles in ways that generate interest from the other disciplines in this overview.
- 34 Timothy Ingold and Gisli Paalson, *Biosocial Becomings* (Cambridge: Cambridge University Press, 2013); Agustin Fuentes, "Re-situating Anthropological Approaches to the Evolution of Human Behavior," *Anthropology Today* 25:3 (2009): 12–17; Jon Marks, "Biological Myth"; Emily Schultz, "Resolving the Anti-Anti-Evolutionism Dilemma," *American Anthropologist* 111:2 (2009): 224–237.
- 35 Deanne-Drummond and Watson, "Becoming Human."
- 36 The emphases being the culture–biology interface and an evolutionary context or a willingness to engage with evolutionary considerations. I have also engaged select scholars for a series of interviews on the topic, but that work is ongoing and not fully analyzed. I will present those results in a separate venue.
- 37 Translation by Joel Green (in Brown, Murphy and Maloney 1998). Note that in this version, Green uses "humanity" as opposed to "man" or "mankind."
- 38 See Agustin Fuentes, *Evolution of Human Behavior* (New York: Oxford University Press, 2009) and Kevin N. Laland and Gillian Brown, *Sense and Nonsense: Evolutionary Perspectives on Human Behaviour*, 2nd ed. (Oxford: Oxford University Press, 2011).
- 39 Brown et al., *Whatever Happened to the Soul?*
- 40 Paul Erlich, *Human Natures: Genes, Cultures, and the Human Prospect* (Washington DC: Island 2002); Laland et al., "More on How and Why."
- 41 Not without a myriad of definitional and explanatory differences, of course. See for example "Does Evolution explain Human Nature?" (2009), available at <http://www.templeton.org/evolution/>.
- 42 Douglas Fry, ed., *War, Peace, and Human Nature* (Oxford: Oxford University Press, 2013); Robert W. Sussman and Robert C. Cloninger, eds., *Origins of Altruism and Cooperation*, Volume 36, *Developments in Primatology: Progress and Prospects* (New York: Springer, 2011), part 2.
- 43 Nicola Hoggard Creegan, "Being an Animal and Being Made in the Image of God," *Colloquium* 39:2 (2007): 185–203; Deane-Drummond, "God's Image and Likeness."
- 44 Agustin Fuentes, "Re-situating Anthropological Approaches"; Marks, "Biological Myth."
- 45 Joseph Henrich, "A Cultural Species: How Culture Drove Human Evolution," *Psychological Science Agenda* 25:11 (2011), available at <http://www.apa.org/science/about/psa/2011/11/human-evolution.aspx>; Jerome Kendall, J.J. Tehrani, and John Odling-Smee, "Human Niche Construction in Interdisciplinary Focus," *Philosophical Transactions of the Royal Society B* 366 (2011): 785–792.
- 46 Jeeves, *Rethinking Human Nature*; van Huyssteen, *Alone in the World?*
- 47 Jeeves, *Rethinking Human Nature*; Sussman and Cloninger, *Origins of Altruism*.
- 48 Differences in adaptive trajectories, niches, and other processes/patterns that act to push related populations/species into distinct evolutionary trajectories; see Malone et al. (2012) for an example with the apes and humans. Malone, N.M., A. Fuentes, and F.J. White. "Variation in the Social Systems of Extant Hominoids: Comparative Insight into the Social Behaviour of Early Hominins" *International Journal of Primatology* 33: 6 (2012): 1251–1277. DOI:10.1007/s10764-012-9617-0.
- 49 The human brain is a good example here. There is a strong continuity in basic structure and physiology with other mammals (especially the apes), but extremely substantive and significant changes in the processes and outcomes of its functioning in the current context (modern humans).
- 50 See Malcolm Jeeves and Warren Brown, *Neuroscience, Psychology, and Religion: Illusions, Delusions, and Realities about Human Nature* (West Conshohocken, PA: Templeton, 2009); Jeeves, *Rethinking Human Nature*; Sussman and Cloninger, *Origins of Altruism*.

- 51 Antonio Damasio, *Self Comes to Mind: Constructing the Conscious Brain* (New York: Pantheon, 2010); V.S. Ramachandran. *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (New York: W.W. Norton & Co., 2011).
- 52 See a wide range of examples in Terrance Deacon, *Incomplete Nature: How Mind Emerged From Matter* (New York: Norton, 2011); Jeeves and Brown, *Neuroscience, Psychology, and Religion*; Jeeves, *Rethinking Human Nature*; Sussman and Cloninger, *Origins of Altruism*.
- 53 Fuentes, *Evolution of Human Behavior*; Laland and Brown, *Sense and Nonsense*; Kim Sterelny, *The Evolved Apprentice*; Kim Sterelny, "Social Intelligence, Human Intelligence and Niche Construction," *Philosophical Transactions of the Royal Society B* 362 (2007): 719–730.
- 54 Candace S. Alcorta and Richard Sosis, "Ritual, Emotion, and Sacred Symbols: The Evolution of Religion as an Adaptive Complex," *Human Nature* 16:4 (2005): 323–359.
- 55 This is constructed by the frequency of co-occurrence and the correspondence between the prominent core elements broad definitional category and the fit of the other core elements under its umbrella of meaning.
- 56 Jeeves, *Rethinking Human Nature*.
- 57 <http://www.ctinquiry.org/research/researchtopic.aspx?id=25>.
- 58 Although the chapters in the book, especially Jeeves' summaries of the conceptual contributions, did influence me during the data collection and analyses for this project .
- 59 *Ibid.*, 32.
- 60 *Ibid.*, 32.
- 61 Jessica Pierce and Marc Bekoff, "Wild Justice Redux: What We Know About Social Justice in Animals and Why It Matters," *Social Justice Research* 25 (2012): 122–139.
- 62 *Ibid.*, 21.
- 63 *Ibid.*, 21.
- 64 *Ibid.*, 21; also see James Proctor, ed., *Envisioning Nature, Science, and Religion* (West Conshohocken, PA: Templeton Foundation Press, 2009).
- 65 Jean Porter, *Nature as Reason: A Thomistic theory of the Natural Law* (Cambridge: William B. Eerdmans, 2005); Deane-Drummond, "God's Image and Likeness"; Brown et al., "Whatever Happened to the Soul?"
- 66 That said, there will always be individuals in each of the core disciplines of interest who will not see moving beyond certain assumed incompatibilities as possible; but those individuals are not the target audiences for this article, nor for any project that has true trans-disciplinarity at its core.

Appendix 1.

Primary sources reviewed that resulted in the extraction and comparison of the 18 core elements

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