Entering the Ethical Space Between Epistemologies: A Step Toward Decolonizing the Heart and Mind

Jennifer A. H. Billman

Department of Science, School, HACC, Central Pennsylvania's Community College
Department of Sociology, Indiana University of Pennsylvania

Background: Evaluation Paradigms present evaluators with differing approaches to evaluating a program's merit, worth, and value. Grounded in varying ontologies (i.e., notions of reality) and epistemologies (i.e., ways of knowing), these paradigms advance differing views of what counts as knowledge. The privileging of Western-centric knowledge (i.e., empiricism) over traditional and revealed (i.e., spiritual) knowledge, places the reigning evaluation paradigms at odds with Indigenous paradigms and presents numerous risks to individuals, communities, and ecosystems. This paper invites readers to step into the ethical space (Ermine, 2007) between epistemologies to interrogate Western knowledge assumptions and identify common philosophical ground between Indigenous and Western ways of knowing. Through an examination of Aristotelian and Cartesian thought and a review of transdisciplinary support for an interactive epistemology which embraces empirical, traditional, and revealed knowledge, I argue that embracing the Knowledge Trinity concept advances the decolonization of evaluator heart and mind and provides a new epistemological foundation upon which to construct a Decolonizing Paradigm.

Purpose: The purpose of this paper is to encourage the decolonizing of Western-trained evaluators'— Indigenous and non-Indigenous alike—heart and mind by arguing for embrace and integration of empirical, traditional, and revealed knowledge in evaluation theory and practice.

Setting: Not applicable.

Intervention: Not applicable.

Research Design: Not applicable.

Data Collection and Analysis: Not applicable.

Findings: Not applicable.

Keywords: *Indigenous evaluation; epistemology; spiritual knowledge; decolonization; Aristotle; Descartes; philosophy of evaluation*

Introduction

As a transdisciplinary field, evaluation seeks knowledge of the merit, worth, and value of programs, personnel, products, policies, and performances across a diverse disciplinary landscape. The theories and methods evaluators use to gather this knowledge reflect held ontologies (i.e., notions of reality) and epistemologies (i.e., ways of knowing). As a result, for Western-trained evaluators—Indigenous and non-Indigenous alike (Singh & Major, 2017)—the risk of advancing methodological colonialism (Puebla, 2016) is real. To combat this risk evaluators are encouraged to decolonize their theory and practice and numerous scholars share recommendations for doing so (Chilisa, 2012; Denzin et al., 2008; Mertens et al., 2016; Waapalaneexkweew, 2018). Kovach (2009) outlined seven steps evaluators can take to decolonize their theory and practice, two of which are discussed in this paper: (a) decolonizing one's heart and mind, and (b) rejecting Western-centric notions of relationship with Indigenous peoples and knowledge. While some may argue that decolonizing one's own thinking does not necessarily lead to decolonizing data collection approaches or ways of reaching evaluative conclusions, Kovach contends that it is a necessary first step toward decolonizing research and evaluation.

Indeed, failing to decolonize one's heart and mind and interrogate Western foundations of knowledge presents numerous risks. In previous work (Billman (2022), I outlined four of these risks: unpreparedness of Western-trained evaluators engaging non-Western communities; alienation of Indigenous evaluators; irrelevancy of—or, worse, harm caused by—evaluation findings to local communities; and deception in reporting. Additional risks include inadequate evaluation practices derived from inadequate ways of knowing (Dohn, 2014); policies built upon fragmented knowledge (Traore, 2016); defunding of programs; partnerships which perpetuate power inequalities (Contu & Girei, 2014); disempowered communities (Duijs et al., 2019); and ecological destruction (Gallagher & Ofir, 2021). Collectively, at a global level these risks may contribute to delays in achieving the UN's SDGs, and to continued destruction of life-sustaining habitats. For individual evaluators, the risk of failing to decolonize one's heart and mind is the failure to experience what it means to be fully human (Freire, 1970/2018) through a life lived interconnected with nature and others.

To mitigate these risks, this paper leads Western-trained evaluators, both non-Indigenous and Indigenous, through the first step of decolonizing one's heart and mind, i.e., the interrogation of the philosophical foundations of Western knowledge. To do this, I invite readers to step into the space between Western thought and Indigenous thought. Cree scholar Willie Ermine (2007) refers to this space as the ethical space and defines it as a theoretical space between cultures and worldviews. While much attention has been given to the superficial differences between Western and Indigenous thought, Ermine argued that "what remains hidden and enfolded are the deeper level thoughts, interests and assumptions that will inevitably influence and animate the kind of relationship the two can have" (p. 195). When writing of the need to decolonize relational systems thinking, Goodchild (2021) described this sacred, ethical space as a teaching space that affirms human diversity, promotes respect and generosity of spirit, supports connection rather than separation, and unlocks a deep capacity for love.

Stepping into this ethical space to interrogate the philosophical foundations of Western knowledge, this paper (a) begins with a discussion of the diverse ways of knowing and how each is important in evaluation, (b) explores the history of Western knowledge fragmentation and how it impacts evaluative understandings, (c) interrogates the philosophies of the founders of Western thought, i.e., Aristotle and Descartes, to reveal common understandings between ancient Western and Indigenous knowledge systems, and (d) provides current support for diverse knowledge representation in evaluation theory and practice. My hope is that through stepping into this ethical space to interrogate Western knowledge assumptions, evaluators will be able to identify common philosophical ground between Indigenous and Western ways of knowing such that new relationships form which advance a transdisciplinary, transontologic (Billman, 2022; Shemsedin, 2016), and transepistemologic decolonizing of evaluation.

Ways of Knowing and the Knowledge Trinity

Addressing the complex problems of the day (e.g., climate change, poverty, war, disease) requires that the evaluation field tap into the multitude of ways that people understand the world and their experience in it. These ways of knowing, i.e., epistemologies, reflect one's understanding of reality, i.e., one's ontology (Billman, 2022). The

current Western-centric epistemologies privilege empirical knowledge, tentatively accept traditional knowledge, and generally discredit revealed knowledge. This knowledge fragmentation differentiates Western knowledge systems from Indigenous knowledge systems that recognize all three ways of knowing as legitimate and necessary for understanding reality.

The words used to describe empirical, traditional, and revealed knowledge highlight the perceived differences between them. Terms like empirical, reductionist, rational, experimental, quantitative, deductive, measurable, controlled, observable, generalizable, material, objective, and written describe Western empirical knowledge. Comparatively, terms used to describe traditional knowledge include holistic, relational, interactional, interrelational, particular, non-generalizable, subjective, intuitive, nonlinear, cyclical, fluid, inclusive, animate, spiritual, and qualitative. (Kovach, 2009; Mazzocchi, 2006, Sumner, 2008). With its emphasis on oral modes of knowledge transmission (e.g., stories, songs, proverbs, metaphors, and talking circles), traditional knowledge further differentiates itself from empirical knowledge (Waapalaneexkweew, 2018; Chilisa, 2012; Desmoulins, 2005; Mucina, 2011; Lavallée, 2009; Roos, 2012; Simpson, 2000). Furthermore, traditional knowledge should not be confused with Indigenous knowledge. Indigenous knowledge is much broader than traditional knowledge, encompassing all three forms of knowledge: empirical, traditional, and revealed (Castellano, 2000; Pierotti, 2011).

Revealed knowledge, also often confused with traditional knowledge, differs from it in one key aspect: revealed knowledge is supra- or supernatural knowledge. It is sacred knowledge that originates from outside the natural boundaries of physical existence yet engages with it.

Inconsistent ways of talking about revealed knowledge contribute to the confusion surrounding it in Western discourse. Referred to as revealed knowledge, spiritual knowledge, religious knowledge, or sacred knowledge, care should be taken not to confuse it with religion. Wilson (2008) differentiated between spirituality and religion, stating that spirituality is "one's internal sense of connection to the universe" (p. 91) while religion is "the external manifestation of spirituality" (p. 91). In this way, revealed knowledge encapsulates spirituality as sacred knowledge that may be revealed through spiritual experiences such as prayer, ceremony, dreams, fasts, sweats, or visions (Chilisa, 2012; Kovach, 2009).

Certainly, the politicization of religion has contributed to disregard for spiritual experience and the wholesale discrediting of revealed knowledge. Webb (2017) detailed numerous arguments against revealed knowledge. These arguments state that revealed knowledge is non-generalizable, unfalsifiable, unverifiable, and naturalistically explainable. However, each of these arguments can be countered. First, if people act upon their beliefs and their beliefs emerge from their experiences, then whatever forms these experiences take—whether grounded in a natural sense experience or a supernatural sense experience—the experiences themselves are "treated as foundational, in need of no further justification" (Webb, 2017, p. 7). Ferguson et al. (2018) stated that "religious and spiritual experiences share common phenomenological elements across cultures and theistic faith traditions" (p. 104), suggesting that the commonality of these supernatural experiences validates them. According to Maxwell (2003) revealed knowledge can be validated through Wilbur's three-step verification process, whereby comparison between an individual's spiritual experiences and resulting experiential data validates the experience. Despite neuroscience's identification of specific brain regions activated during spiritual experiences, (Ferguson et al., 2018; Ferguson et al., 2021, Kapogiannis et al., 2014), there remains no consensus among neuroscientists regarding the naturalistic explanations of these experiences (Laker, 2015). If supernatural experiences are rejected because of their correspondence to neurological activity, then all experience must be rejected, since all experience corresponds to neurological activity (Webb, 2017). Granted, accepting that a supernatural experience occurred and accepting that this experience revealed certain knowledge, does not imply that the belief grounded in that knowledge itself is true. Yet, currently, mainstream, desacralized Western knowledge systems reject the very existence of supernatural, spiritual experience and the revealed knowledge linked to it.

Although the Western-centric view of knowledge depicts it in a fragmented form, a trinitarian perspective emphasizes the unique but equal value of each knowledge to understandings about reality. Figure 1 depicts this relationship between the three knowledges, empirical, traditional, and revealed. Like Maxwell's (2003) epistemology of inner knowledge, which aligns with Saint Bonaventure's three "eyes" (eye of the flesh, eye of the mind, and eye of contemplation; p. 263), the Knowledge Trinity purports that the three knowledges are not separate. They are continuously interacting, each representing one facet of *one* knowledge; "*equal yet differentiated*" (Goodchild,

2021, p. 81). The knowledges interact and interconnect; alienation of one from the others resulting in limited knowledge and understanding.

Figure 1. The Knowledge Trinity
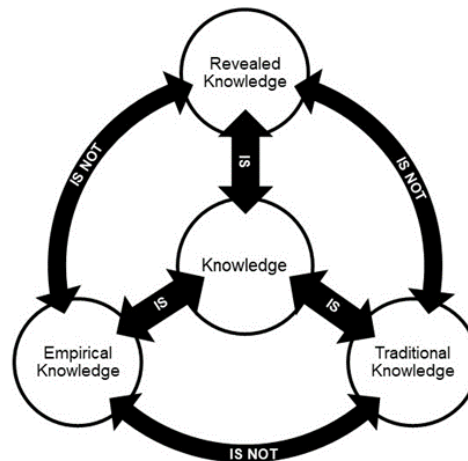
At first glance, this recommendation to embrace the Knowledge Trinity may resemble mixed-methods evaluation design's call for triangulation. As a tool to improve the validity and credibility of evaluation evidence, triangulation requires incorporating multiple data sources, theories, approaches, methods, or evaluators in an evaluation. However, triangulation itself does not require that the selected theories, approaches, or methods reflect each of the three ways of knowing. Application of the Knowledge Trinity in evaluation would raise the expectation for triangulation to include data sets, theories, approaches, methods, or individuals representative of each of the knowledges, i.e., empirical, traditional, and revealed. At minimum, recognition of the Knowledge Trinity reminds evaluators to explore multiple ways of knowing when determining what evidence to gather and how to go about gathering that evidence.

Failure of the Western field of evaluation to acknowledge the interaction of empirical, traditional, and revealed knowledge discredits the lived experiences of individuals, Indigenous and non-Indigenous alike, who embrace the Knowledge Trinity. Wilson (2008) wonders, "How is it that spirituality is so important to Indigenous people when Western society has so distanced itself from anything spiritual?" (p. 29). Kovach (2009) grounds alienation of Indigenous knowledge in the unacceptance of sacred (i.e., revealed) knowledge in Western research. She writes, "The proposition of

integrating spiritual knowings and processes, like ceremonies, dreams, or synchronicities, which act as portals for gaining knowledge, makes mainstream academia uncomfortable, especially when brought into the discussion of research" (pp. 67–68).

Because it is easier to deny the significance of revealed knowledge then to defend it within the Western framework, revealed knowledge exists for most as something "peripheral, anthropological, [and] exotic" (Kovach, 2009, p. 67), a mere vestige of past times considered largely irrelevant to knowledge acquisition today.

A Brief History of Western Knowledge Fragmentation

The narrowed, modern Western-centric view of knowledge resulted from the gradual alienation of traditional and revealed knowledge due to the selective advancement of empirical knowledge. Although both Aristotle and Descartes relied on multiple approaches to knowledge generation, embrace of only some of these approaches underlaid the development of modern Western thought. Selective application of Aristotle's emphasis on observation and reason and Descartes' emphasis on reductionism, rationalism, reason, and methodological doubt drove the narrowing of Western thought during the 16th and 17th centuries. With the advance of the scientific revolution, the

reigning beliefs propagated by the religious establishment about nature and humanity's place in it were displaced. Marked by mathematical advancements and a rise in confidence in humanity's ability to reason about the natural world, the scientific revolution ushered in the Age of Enlightenment. French, German, and Scottish scientists and philosophers of the 17th and 18th centuries advanced "the process of undertaking to think for oneself, to employ and rely on one's own intellectual capacities in determining what to believe and how to act" (Bristow, 2011, p. 3). In privileging the individual as the primary source of knowledge, Enlightenment philosophies rebuked other sources of knowledge. These other "carriers of authority (such as tradition, superstition, prejudice, myth, and miracles)" (Bristow, 2011, p. 3) stood in stark contrast to Enlightenment reason and as such were pushed to the margins of Western discourse. Although "the spiritual[,] as a complement to the purely mechanical, remained an important methodological thread of the Scientific Revolution" (Anderson & Hepburn, 2016, p. 9), as Enlightenment advanced, revealed knowledge and traditional knowledge were increasingly discredited. Even empirical knowledge underwent a winnowing, upholding the primacy of natural (as opposed to supernatural) sensory engagement through scientific methodology (observation and experimentation). Thus, the stage for Western thought was set with both ontological and epistemological commitments to knowledge derived through reason or experimentation, rather than tradition or revelation. From this stage the Western field of evaluation emerged, from its start alienating, , spiritual, traditional, and holist knowledge systems.

Currently, although many evaluation funders consider quantitative evidence representing empirical knowledge the gold standard for evaluation, qualitative evidence representing traditional knowledge is increasingly embraced and accepted. Certainly, the rise of mixed methods has proven effective in linking empirical and traditional knowledge domains in a more interactional manner. Yet, despite this re-entrance of traditional knowledge into the Western knowledge landscape, spiritual experience and the revealed knowledge linked to it have yet to be widely (or even narrowly) recognized in Western scientific thought.

This continued fragmentation of knowledge fails to prepare evaluators for engaging with communities that embrace all three ways of knowing: empirical, traditional, and revealed. When a knowledge system is devoid of traditional and/or revealed knowledge all the methodological tools emerging from it will fall outside the Indigenous knowledge domain. Consequently, only tools derived from within a paradigm acknowledging all three knowledges—empirical, traditional, and revealed—will be useful to non-Western communities. Wilson (2008) states, "We will always face problems in trying to adapt dominant system tools to our [Indigenous] use" (p. 13). Although "a recognition of spirituality allows researchers to explore the interconnections between the researched's experience and the sacred and the practical aspects of research" (Chilisa, 2012, p. 114), revealed knowledge remains largely unaddressed in evaluations, even among those using qualitative methods. While empiricism indeed plays *a* role in knowledge production, it does not account for knowledge production through other pathways, notably tradition (i.e., tacit, cultural knowledge) and spirituality (i.e., spiritual, revealed knowledge) (Castellano, 2008; Pierotti, 2011), both accounted for in Indigenous epistemologies. Because of this, when a Western-trained evaluator conducts a program evaluation in a non-Western community, use of tools stemming from a limited epistemology may lead to limited understandings of program efficacy and harm to the community and land. To address this, reflection on the Knowledge Trinity prompts evaluators to ask what may be missed when relying on only one way of knowing and encourages evaluators to interrogate why it is they hold to certain ways of knowing over others.

Shared Understandings in Western and Indigenous Philosophy

Decolonizing one's heart and mind requires interrogation of held ontologies (Billman, 2022) and epistemologies. A Western-trained evaluator's recognition of the limited epistemological foundation of their training is the first step of this interrogation. In contrast to Western epistemology, Wilson (2008) describes an Indigenous epistemology as one "built upon relationships between things, rather than on the things themselves" (p. 74). This emphasis on relationship, including abiotic–biotic and material–immaterial interactions, challenges Western-trained evaluators hesitant to move away from what they were taught to believe about reality and how best to understand it. Yet, deep interrogation of the foundation of Western thought reveals that its founders, namely Aristotle and Descartes, agreed more with Wilson than most realize. Recognition of an alignment between Western and Indigenous knowledge systems opens the door for engagement as it invites evaluators into the ethical space

between epistemologies so that new relationships between knowledge systems can emerge.

Figure 2. The Flow Cycle
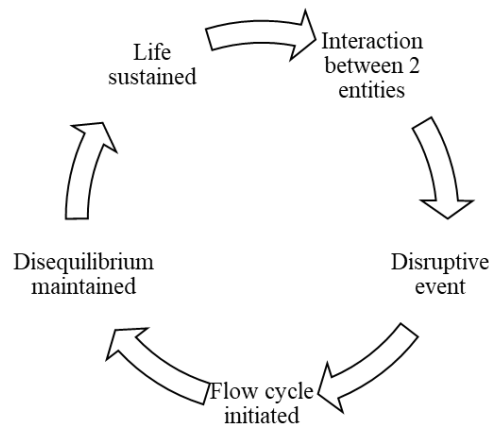
At its inception Western thought acknowledged the existence of and interaction between the material and the immaterial. Aristotle termed unknowable, immaterial, unchanging entities Prime Movers and attributed the origin of all motion to them. He argued that knowledge extends from an awareness of the unchanging nature of the Prime Movers, i.e., the "invariable and necessary truths about nature" (Parry, 2014, 3; Aristotle, n.d., para. 3), and the impact their immutability has on all other entities. Similarly, René Descartes emphasized the role of motion in knowledge production. He argued that we become aware, i.e., knowledgeable, of an object because its motion produces a perceptible change in the environment (Smith, 1963, p. 112). These changes in the environment create a disruption leading to a new state or a return to the previous state (Figure 2), prevent equilibrium, and sustain life (Pierotti, 2015; Bejan & Zane, 2012). Because death occurs when all free energy is consumed, living systems sustain life by maintaining disequilibrium through continuous energy transformations. While life is sustained through disequilibrium, knowledge of an entity emerges from the interaction. Thus, an interactive relationship between the material–immaterial and abiotic–biotic undergirds all reality and knowledge production. Yet, despite this awareness, desacralized Western thought does not recognize as equally valid all interactions nor the knowledge linked to them.

Recognizing this, evolutionary biologist and Indigenous scholar Pierotti (2015) argued that Indigenous recognition of abiotic factors as participating in flow cycles aligns with ancient Aristotelian thought as well as modern laws of physics, namely constructal law (Bejan & Lorente, 2010). Explaining how flow occurs in the direction of configuration (e.g., water carves out a pathway which enhances its flow), physicists Bejan & Lorente argued, "The configuration phenomenon unites the animate with the inanimate" (p. 1337). For Bejan, knowledge is not information but flow, defined as "the ability to affect, to make, to design change" (as cited in Dimancescu et al., 2015). As flow, knowledge is not bounded by any material state, animate or inanimate. For example, Goodchild (2021) describes how dialogue understood in the Two-Row Wampum Treaty is "meaning flowing through" (p. 83). This emphasis on flow aligns with Constructal Law and supports two Indigenous concepts: (a) that meaning comes through relationship and interaction, and (b) that life encompasses any entity through which energy flows (Pierotti, 2015).

This recognition of a shared dependency of Western and Indigenous epistemology on interaction and flow to produce knowledge invites evaluators into an ethical space that supports systems thinking and emphasizes the interaction and interdependence of all living things and their environment. Hill (as cited in Goodchild, 2021) pointed out that "knowledge is innately tied to the land, it's right there, it's waiting for us to pay attention to it, to guide us, through dreams, through visions, through practice, and maybe that's our greatest strength, is getting people reconnected to the source of knowledge" (p. 89). That source of knowledge is the interaction and relationship of the

different knowledge systems in the sacred, ethical space.

When evaluators trained within a narrowed Western-centric knowledge system step into this sacred, ethical space, they are freed to engage Indigenous ontologies and epistemologies that value knowledge gained through interactions with both the material and immaterial (Chilisa, 2012; Wilson, 2008). Quantum physicist Fernando Sols (2013) discussed realities that fall outside the domain of materialistic worldviews:

> Whether one wants to use this self-acknowledged limitation of science to infer the existence of realities outside the domain of science, with an element of immateriality, it is a philosophical choice. Many can find it natural

to conclude that the proved existence of internal limits to science reinforces the notion that there are also external limits, i.e., that there are realities not fundamentally attached to the domain of matter. (p. 698)

If evaluators make the philosophical choice to accept the shared epistemological premise of interaction and flow, a pathway for integration of Western and Indigenous epistemologies emerges. Extending game theory's interactive epistemology (Aumann, 1999), an emergent interactive epistemology (Figure 3) may help evaluators conceptualize how interactions among all things, animate and inanimate, as well as material and immaterial, produce knowledge.

Figure 3. Emergent Interactive Epistemology Conceptual Model

Acceptance of an emergent interactive epistemology calls into question the current state of evaluation paradigms, each with its limited epistemology. These paradigms' epistemologies reflect the boundaries placed on ancient Aristotelian and Cartesian thought as Western thought evolved. Failure to recognize these boundaries resulted in misapplication of Aristotelian and Cartesian epistemic principles. In a practical sense, placing boundaries on Western thought freed investigators to tackle the questions most likely to yield answers (Lewontin, 2000). Yet, Leroi (2014) warned against mistranslating Aristotle by "attributing to him ideas that he could not possibly have had" (p. 9), as he existed long before modern scientific methodology emerged. Likewise, Hatfield (2018) asked, how modern

interpreters could "get Descartes so wrong?" (p. 51). He suggested that postmodern theorists and practitioners rarely read Descartes' writings firsthand and, in failing to do so, uncritically embrace and pass on the misunderstandings of their mentors. Without direct engagement with these original works, misunderstandings about reality and how it can be known abound. These misunderstandings result in tensions between paradigms, which manifest as debate over deductive *or* inductive reasoning and quantitative *or* qualitative methodology.

Numerous philosophers and researchers have attempted to resolve these tensions by arguing that Aristotle viewed knowledge as more inclusive than most realize (Dawes, 2017). While most of his writings focus on knowledge of the material

through empirical means of inquiry, Aristotle also wrote about immaterial realities and the subjective. Despite his focus on the material, which laid the groundwork for the desacralization of knowledge, Aristotle subjugated all knowledge of the material to the existence of the *immaterial* (i.e., the Prime Movers). Further interrogation of Aristotle's writings reveals that he embraced knowledge that was both holistic and reductionist, inductive and deductive, quantitative and qualitative, subjective and objective. Coupled with his adherence to immaterial Prime Movers as the source of all knowledge, Aristotle promoted epistemological diversity as key to understanding the world. Therefore, although some attribute "The whole is greater than the sum of its parts" to Aristotle,[1] his writings on mathematical wholes and parts and animal wholes and parts (Aristotle, ca. 350 B.C.E./n.d.), do not privilege holism over reductionism, or vice versa. Instead, Aristotle's approach to knowledge is inclusive. Historically, then, Aristotle provides a model for how knowledge can be acquired through both holism and reductionism.

Similarly, Aristotle's method of inquiry was both inductive and deductive (Ellwood, 1902). Aristotle argued that because one does not possess a priori knowledge of all living things, deductive methodology must give way to inductive methodology. Early philosophical commentators, namely Averroes in 1169 and Gersonides in 1323, suggested that Aristotle's approach to this methodological dilemma was a *synthesis* of "the two opposing methods of scientific discovery: sense perception and rational reasoning" (Gaziel, 2012, p. 340). Gersonides, further argued that discovery, i.e., knowledge production, proceeds through "heuristic reasoning … a style of back-and-forth between theory and empiric evidence" (as cited in Gaziel, 2012, pp. 341–342), between observation and reflection. Clearly these thinkers of antiquity recognized the importance of an interactive epistemology for knowledge acquisition.

Furthermore, Aristotle embraced both quantitative and qualitative as well as subjective and objective ways of knowing. Neuenschwander (2013) argued that the antagonism between quality and quantity reflects the modern scientific period but not the foundation of the sciences. "Aristotle's world view was to a large extent a qualitative one" (p. 2599) and he addressed questions of quality and quantity. However, as instrumentation and

statistics developed and scholars attempted to quantify qualities, quantitative inquiry displaced qualitative inquiry. Eventually, mathematicians and physicists recognized that "dynamical, complex systems can never be fully objectively known" (p. 2606). Hanson (2015) extended Neuenschwander's argument, stating that the debate over subjectivity and objectivity did not concern Aristotle. Because Aristotle wrote humans into the process of knowledge legitimization, his empiricism affirmed "human subjective social constructions … [and] recognized the importance of human subjective perceptions" (p. 862).

Recognizing that one of the founders of Western thought embraced multiple pathways to knowing frees Western-trained evaluators (a) to challenge the narrowed ways of knowing gained through their Western training, and (b) to explore multiple ways of knowing in theory and practice. This freedom—which accompanies the decolonization of hearts and minds—takes evaluators beyond mere embrace of mixed methods and ushers them into the ethical space between epistemologies. Sharmer (as cited in Goodchild, 2021) described the ethical space between objective and subjective knowing as *resonance* and defined it as a place of deep sensing. He explained that "deep sensing requires interacting with a system not only from the outside (3rd person view), but also from within (adding the 1st and 2nd person views to scientific activity)" (p. 88). It is in the ethical space between epistemologies that evaluators engage in this deep sensing and in so doing advance their ability to address society's complex, wicked problems (Billman, 2019; Brown et al., 2010; Hopson & Cram, 2018).

Like Aristotle's epistemology, Descartes' epistemology is not as narrow as the Western epistemology that grew from it. For one, Descartes grounds all knowledge in an immaterial, imperceptible reality. What to Aristotle were the Prime Movers, now is Descartes' God. Descartes (1641/2018) wrote, "And thus I very clearly see that the certitude and truth of all science depends strictly on the knowledge alone of the true God, insomuch that, before I knew him, I could have no perfect knowledge of any other thing" (p. 49). Upon this truth, Descartes constructed a methodology of doubt. Holding that ideas lie within a person and are thus not dependent on the senses to be known, Descartes subjugated Aristotle's empiricism to reason. Unlike Aristotle, who did not provide a

---

[1] In Metaphysics 1045a8–10 Aristotle writes of things "which have several parts and in which totality is not, as it were, a mere heap, but the whole is somethings besides the parts" (Cohen, 2016), which is the closest

statement to the more popularized yet misattributed statement "The whole is greater than the sum of its parts."

systematic epistemology (Dawes, 2017), Descartes provided a systematic method for deconstructing all ideas until arriving with certitude at an idea upon which knowledge could be constructed. Despite his reductionistic approach to knowing, Descartes embraced the contextualization of knowledge and acknowledged that "depending on the *context* [emphasis added] of inquiry, the standards of knowledge-worthy justification might *vary* [emphasis added]" (Newman, 2016, p. 8). If this be the case, then Descartes' reason may be considered a contextualized justification for knowledge, but not its sole justification, opening the door for multiple approaches to knowledge justification based on context.

Granted, as Western thought evolved, it became increasingly desacralized and fragmented as Descartes' reductionism was decontextualized and his embrace of an immaterial source of all truth ignored. Indeed, Descartes' machine metaphor laid the foundation for modern Western knowledge systems which privilege reductionism and reject the holism embraced by Indigenous knowledge (Kovach, 2009). However, Lewontin (2000) argued that overreliance on Descartes' metaphor "led to an overly simplified view of the relations of parts to wholes and of causes and effects" (p. 72). "Like any metaphor, it catches some aspect of the truth but leads us astray if we take it too seriously" (p. 38). Although Lewontin recognizes the value of the reductionist model and its many contributions to understanding life, he warned against its universal application. Similarly, Beresford (2010) warned of overreliance on a philosophy of reductionism. Outlining three weaknesses of reductionism, Beresford (2010) contends that reductionism (a) isolates knowledge in the hands of a few and alienates the broader populace, (b) can be systematically biased, leading to oversimplification of complex problems, and (c) may lead to misrepresentation of causal pathways (p. 721). Evaluators confront these challenges when they overextend the Western metaphor in Indigenous settings without acknowledging the limitations of this approach. For both Beresford and Lewontin, then, the Western epistemic model is but one approach to knowing, valuable in certain contexts but not all.

Most surprisingly, the fact that Descartes grounded all his thinking on revealed knowledge seems irreconcilable with modern notions of desacralized Cartesian thought. The modern emphasis on Descartes' reason and reductionism overshadows his own declared dependency on revealed knowledge and his ontological commitment to an immaterial existence. Most modern writings about Descartes pick up with his

development of methodic doubt and his proclamation that "I am, I exist, is necessarily true whenever it is put forward by me or conceived in my mind" (Newman, 2016, p. 31; Med. 2, AT 7:25)—more parochially, "I think, therefore I am." This separation of the mind from the senses promoted knowledge fragmentation. Yet, writing in his *Meditations on First Philosophy*, Descartes (1641/2018) stated that after full deconstruction of all his held ideas,

> There only remains, therefore, the idea of God, in which I must consider whether there is anything that cannot be supposed to originate with myself.... For though the idea of substance be in my mind owing to this, that I myself am a substance, I should not, however, have the idea of an infinite substance, seeing that I am a finite being, unless it were *given to me by some substance in reality infinite* [emphasis added]. (p. 31)

Thus, by Descartes' own admission, Cartesian methodology emerged from revealed knowledge given to him through dreams. Recognition of this fact challenges the philosophical assumptions of modern Western thought which reject revealed knowledge.

For those trained in the West and taught to reject revealed knowledge, learning that the father of rationality grounds all knowledge in revelation is epistemologically disruptive. Indeed, most texts altogether avoid the topic of Descartes' dreams, with only a handful of philosophers attempting to reconcile this perceived irrational mode of knowledge transmission with the father of modern rationalism. As Keevak (1992) points out,

> There seems to be a very real danger that the philosopher who (at the very least) is given credit for the founding of modern rationalism—the most "awake" of all philosophers, in other words—might have begun his career with a series of enthusiastic and therefore "irrational" dreams, in which in fact "the human mind had played no part." (p. 375)

Moreover, writing in his unpublished *Olympica*, Descartes claims that it had been revealed to him that he would have these dreams several days before they occurred and "that the human mind had no share in them" (Smith, 1963, p. 38). Through his

three dreams[2] Descartes concluded that the Spirit of Truth had bestowed knowledge to him and opened his mind to "all the treasures of all the sciences" (Smith, 1963, p. 37). Descartes resolved the tension between revealed knowledge and empirical knowledge by postulating that "*all* human knowledge (not only knowledge of the material world through the senses) depends on metaphysical knowledge of God" (Bristow, 2011, p.6). Perhaps anticipating the tensions between reason and revelation others may experience when engaging his work, over time Descartes' own writings acknowledged this pivotal moment in his life less and less (Keevak, 1992). Nevertheless, the provocative nature of Descartes' dreams authenticates their existence and highlights Descartes' commitment to divine, supernatural existence and revealed knowledge. As Keevak (1992) stated, "their very 'absurdity' seems to be a guarantee, in short, … that the dreams had 'come from above' " (p. 391). Although the meanings of Descartes' dreams and their relevancy to him have been debated (Browne, 1977; Campbell, 2013; Gabbey & Hall, 1998; Keefer, 1996; Keevak, 1992), their authenticity has not (Smith, 1963).

The above interrogation of the philosophical foundation of the modern Western view of knowledge demonstrates that the recognized founders of Western thought—Aristotle and Descartes—held to broader ways of knowing than what most acknowledge today. However, as time advanced Aristotle's embrace of an integrative epistemology and Descartes embrace of revealed knowledge were ignored, forgotten, or misrepresented. This resulted in a fragmented knowledge system alienating the majority of the global population, who attest to the existence of the supernatural. Ferguson et al. (2021) reported that "eighty percent of the world's population consider themselves religious with even more identifying as spiritual" (p. 1). In another global study of unbelief, even atheists and agnostics reported belief in supernatural phenomena, with less than a third adhering to strict materialism (Bullivant et al., 2019). Given that the majority world population embraces spirituality and immaterial ways of knowing, epistemologies that do not include revealed knowledge fail to tap into the fullness of the human experience. This realization should prompt evaluators to examine their guiding principles to see if/how they explicitly recognize ways of knowing beyond empirical knowledge, i.e., traditional and revealed knowledge.

Transdisciplinary Support for Revealed Knowledge in Evaluation

Of the three knowledges of the Knowledge Trinity, revealed knowledge and the spiritual experiences linked to it remain discredited as valid evidence by many evaluators trained in the West. Ferguson et al. (2021) defined spirituality as "a stable shift in worldview towards belief in forces that cannot be *rationally* [emphasis added] comprehended or objectively proven" (p. 1). Reflecting on Scriven's philosophical writings regarding rationality provides a glimpse into the field's epistemological past and opens the door for evaluators to enter the ethical space between epistemologies. In *Primary Philosophy*, Scriven (1966) differentiated between rational and irrational thought, defining rationality as use of the best method available to attain a certain outcome (p. 11). Through numerous examples and explanations, he outlined several key points about rationality as he understands it.

1. Rationality is using the best method to obtain a desired outcome.
2. If a procedure produces knowledge, then it is a rational approach.
3. Good evidence consists of similar occurrences that serve as reliable predictors.
4. If useful, then inclusion into the knowledge framework should be granted.
5. Irrationality is use of the wrong method.

As a rationalist, Scriven argued that "reason is the only route to knowledge" (p. 16) and the "only guide to truth is reason" (p. 18). Thus, for Scriven, there is but one path to knowledge, i.e., one epistemological route—the path through reason and rationality that emerges from sense experience. He wrote, "We want to be right, about the future, about our beliefs, about our practical choices. The best way to be right is to be rational" (p. 17). For Scriven, being right—being rational—is choosing the best method.

Certainly, choosing the best method to accomplish a task seems rational, and evaluators make these rational choices when selecting the theory, method, approach, tools, etc. they will use in an evaluation. However, when working within a fragmented knowledge framework, the options available to an evaluator are limited. Opening the door to a more interactive epistemology that

---

[2] Smith (1963, pp. 33–39) provides the most widely accepted English translation of Descartes' dreams.

embraces multiple ways of knowing, Scriven (1966) acknowledged that "as soon as a procedure can be identified as producing knowledge … it becomes part of the rational approach to that end" (p. 16). If this be the case, any approach that produces knowledge is a rational approach, making empiricism, tradition, and revelation equally rational pathways to knowledge production. Yet, many discount traditional knowledge and revealed knowledge's evidentiary validity, excluding them from their evaluation theories and practices.

On this point Scriven (1966) again opened the door for an interactive epistemology when he argued that good evidence consists of empirical knowledge in the form of records of similar occurrences in the past that now serve as reliable indicators of the future. If good evidence is the accumulation of similar events with predictive power, Pierotti (2011) explained that traditional Indigenous knowledge *is* empirical knowledge because it is based on years of data collection in the form of stories vetted by community members and tested over time for their reliability and validity. Not bound to written transmission, Pierotti asserted that stories subjugated to constant revision based on additional experiences ensure their validity and, in this way, Indigenous knowledge eclipses Western knowledge (p. 10). As Scriven (1966) acknowledged, knowledge holders are like instruments calibrated by experience (p. 39).

Granted, the integration of revealed knowledge with traditional and empirical knowledge as exemplified in Indigenous knowledge systems presents a challenge to a desacralized Western philosophy. Referring to revealed knowledge as unexplained ways of knowing, Scriven (1966) discounted such knowledge as good evidence because it cannot be subjected to systematic testing. However, when recounting the development of the Western number system, Scriven (1966) argued that the eventual *inclusion* of some numbers which were initially rejected made the number system *more useful*. Thus, usefulness provided a defense for their inclusion in the accepted knowledge framework. Applying this logic to knowledge production, embrace of traditional and revealed knowledge alongside empirical knowledge would make the "franchise useful for the purposes of evaluation" (Scriven, 1966, p. 30) and support the decolonization of evaluation.

Though the epistemology espoused in *Primary Philosophy* (Scriven, 1966) represented the reigning desacralized, Western worldview at the time, more recently, Scriven questioned its relevance to solving the complex issues of the day. In 2010, Scriven called for a reconceptualization of evaluation from the ground up, a Copernican revolution, "a radical shift in the framework of our thinking about a substantial subject matter area, i.e., a rejection and/or redefinition of the most fundamental assumptions involved in the theories and possibly the language and data formats of the area" (para 2). This call parallels Cajete's (2000) call for a cosmological reorientation of human thought. Such a radical shift and reorientation requires a raising of consciousness (Freire, 1970/2018; Goodchild, 2021) that occurs through "a bombardment by examples, each of which could be dismissed in itself but which aggregate to a voltage level that overloads the defensive circuits and forces one into a different attitude" (Scriven, 1980, p. 11).

Although few researchers embracing revealed knowledge find a voice in the published literature of Western-centric science, scattered across disciplines there exists support for inclusion of revealed knowledge in the Western knowledge system. Pulling those supporters' voices together here provides solid evidence that despite its alienation in Western thought, revealed knowledge remains a viable form of knowledge. As a transdiscipline, the field of evaluation, its theorists, and its practitioners should take note of the multidisciplinary nature of this support and incorporate revealed knowledge into evaluation.

From the theoretical sciences, quantum mechanics provides support for the existence of a quantum reality which can be known through spiritual experiences. Making the argument that quantum mechanics provides the bridge between empirical scientific knowledge and spiritual knowledge, Mensky (2014) explained, "the phenomenon of super-consciousness … refutes the imaginary incompatibility of scientific and spiritual forms of knowledge and explains "mystical" powers of consciousness as existing due to the specific quality of quantum reality" (p. 78). Furthermore, this super-consciousness can occur in human and non-human individuals. Echoing Mensky, Maxwell (2003) elaborated on quantum theory's blow to scientific materialism. He stated that Western science, grounded in a narrowed understanding of Cartesian thought, leads to fragmented thinking and perception, resulting in alienation (pp. 258–529). Quantum theory, on the other hand, provides a holistic worldview that allows for integration of scientific empiricism and spiritual experience. Recommending an integrated epistemology that combines sensory experience and its empiricism, mental experience and its rationalism, and spiritual experience and its mysticism (p. 264), Maxwell asserted that only through integration will the current crisis of fragmentation within Western

thought be resolved. Such integration is reflected in the Knowledge Trinity.

The effects of the current Western knowledge fragmentation may be most realized by health care professionals and their patients. Hartrick (2002) argued, "The dissociation between the domains of knowledge continues to perpetuate the fragmentation of people's health and healing experiences" (p. 27). Reporting on the effects of knowledge fragmentation in health care settings, Schaefer et al. (2012) stated that the lack of spiritual knowledge among nurses leads to fragmented care given to patients. Because many Ojibwe credit their awareness of treatment to dreams, fasting, or contact with spirits, Turton (1997) emphasized the need for nurses to be knowledgeable of and accepting of revealed knowledge. If nurses reject revealed knowledge as valid, they are less likely to support patients with their spiritual needs, which may negatively impact a patient's healing. Fortunately, through educating nurses on spiritual knowledge, nurse comfort with revealed knowledge and readiness to support patients with their spiritual needs can increase (Lovanio & Wallace, 2007; Meredith et al., 2012; Schaefer et al., 2012; Wallace et al., 2008).

Considering education more broadly, several scholars point out the lack of attention given to spirituality in education pedagogies grounded in the Western scientific paradigm. Snively and Williams (2019) pointed out that spirituality is rarely addressed in the science classroom although it cannot be separated from the physical world (p. 5). Likewise, Watson (2009) proposed that spiritual knowledge be included alongside scientific knowledge and argued that the rejection of spiritual knowledge in the classroom damages children's well-being. In contrast, providing space in the classroom for dialogical discussion of the contributions of both science and spirituality can "help humanity explore ways of living and learning together" (p. 321).

Similarly, Beringer (2006) challenged the fields of environmental education and environmental studies to "reclaim religious-spiritual paradigms, and guard against the dominant scientific worldview" (p. 39). With a focus on the current global environmental crisis, Beringer reflected on the fragmentation of nature from the sacred as secular humanism infiltrated the environmental science classroom. This fragmentation resulted in educational curricula with limited tools to help students address environmental crises, the alienation of people groups from the environmental discourse, and delayed environmental mediation efforts. Beringer (2006) recommended environmental students and scholars engage

Indigenous spiritualities to embrace a "resacralized, spiritualized, sustainable world" (p. 40) and recognize spirituality as the foundation of all knowledge (Benally, 1992). In agreement, Goodchild (2021) advanced an ecological systems view of life grounded in spiritual awareness. When discussing science and spirituality, geologist Riggs (1998) stated, "Science and spirituality, in any form, cannot be the simple antitheses of each other. They must be viewed rather as complementary functions, each of which contributes immensely to the knowledge of the human species" (p 218).

Benefits of the application of revealed knowledge extend beyond the environment. Women's studies scholars suggest that the practical aspects of revealed knowledge may assist with resiliency of the oppressed. Reflecting on the role of ancestral and spiritual knowledges of Indigenous women, Neeganagwedgin (2013) emphasized the struggles endured by Indigenous women living in a Western culture that rejects spiritual knowledge. For these women, ancestral and spiritual knowledges equip them to overcome oppression. Likewise, Tangenberg's (2000) study of mothers with HIV revealed the importance of spiritual knowledge in equipping women marginalized by race, disease, and poverty. As a social worker, Tangenberg advocated for validating forms of knowledge—including revealed knowledge—that influence individuals' everyday life which would enhance "understanding of social problems and the development of meaningful and effective policies and intervention strategies" (p. 47).

However, care should be taken when incorporating revealed knowledge into an evaluation, study, or project. Weatherdon (2017) recorded the conflicts that arise when Western knowledge paradigms attempt to include revealed knowledge, but only in the abstract, separating spirituality from everyday experiences. Examining the relationship between the Canadian Nuclear Waste Management Organization (NWMO) and North American Indigenous peoples, Weatherdon noted that despite the NWMO's acknowledgment of the central role of revealed knowledge in Indigenous communities, it was "removed from its geographical, social, and cosmological context, and disjoined from the realm of practical experiences and everyday relationships" (p.104). As this case demonstrates, recognition and inclusion of revealed knowledge does not guarantee its influence in corporate decision-making processes.

To assist organizations with their attempts to embrace revealed knowledge, Steingard (2005) presented a model for spiritually informed organizational management theory, i.e., spiritual management. In contrast to "current attempts to

situate spirituality within management [which] transmogrify the freshness, depth, and transformative potential of spirituality into yet another vehicle to more efficiently produce the materialistic ends business demands" (p. 231), Steingard's model equips organizations to address the negative practical implications of rejecting spiritual knowledge within organizational leadership.

Although collectively these scholars provide a strong case for inclusion of revealed knowledge in Western knowledge, the potential impact of their shared voices remains elusive due to the disciplinarian fragmentation prevalent in the academy. Yet, when presented in aggregate, they attest to a growing dissatisfaction with the reigning, dominant Western knowledge paradigm. The combined effect, as Scriven might put it, "forces one into a different attitude" (1980, p.11). Because evaluators engage each of these disciplines, it behooves evaluators to explore how to incorporate revealed knowledge into their theory and practice.

Conclusion

Ermine (2007) called for an ethical space—the space between epistemologies—where "meaning through flow" can occur between Indigenous and non-Indigenous peoples. For many Western-trained evaluators, taking the first step into this space may be the hardest, as it requires confronting the epistemological indoctrination of their training, which privileges empirical knowledge while dismissing traditional knowledge and outright rejecting revealed knowledge. Built upon misapplication of Aristotelian and Cartesian ontologies and epistemologies, this knowledge fragmentation fails to recognize the fullness of the ontological continuum (Billman, 2022) and multiple pathways to knowing (i.e., the Knowledge Trinity). For Western-trained evaluators seeking to decolonize their hearts and minds through recognition of the Knowledge Trinity, education on revealed knowledge can help avoid misappropriating it in evaluation theories and practice. But education alone may not lead to liberation if revealed knowledge is not granted influence in decision-making processes throughout an evaluation. As Sumner (2008) warned, "Squeezing spiritual knowledge into a Western analytic framework can distort and even instrumentalise it in a way that was never intended" (Knowledge aporias: What is left out section, para. 4). Clearly, if the evaluation field is going to embrace revealed knowledge in its theories and practice, it will take work.

Decolonizing one's heart and mind (Kovach, 2009, p. 169) *is* work. It requires wrestling with the philosophical premises of the evaluation field and the indoctrination occurring within evaluator education. It requires entering the sacred, ethical space between epistemologies to discover how the epistemologies people hold can lead them to either harm or nurture one another and nature. It demands refusal to participate in opportunities that exclude multiple ways of being and knowing. It may cost materially. But as each person commits to this work—commits to doing one thing (Waapalaneexkweew, 2018)—and shifts from a colonizer mindset to a decolonized mind, the field of evaluation will follow. My hope in writing this article is that the information shared here (a) releases Western-trained evaluators, Indigenous and non-Indigenous alike, from the belief that there is no room in Western thought for epistemological integration and (b) encourages evaluators to embrace empirical, traditional, and revealed knowledge in both theory and practice.

References

Anderson, H., & Hepburn, B. (2016, Winter). Scientific method. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy*. https://plato.stanford.edu/archives/sum2016/entries/scientific-method/

Aristotle (n.d.). *On the parts of animals* (W. Ogle, Trans.). The Internet Classics Archive. http://classics.mit.edu/Aristotle/parts_animals.1.i.html (Original work published ca. 350 B.C.E).

Aumann, R. J. (1999). Interactive epistemology I: Knowledge. *International Journal of Game Theory*, *28*(3), 263–300. https://doi.org/10.1007/s001820050111

Bejan, A., & Lorente, S. (2010). The constructal law of design and evolution in nature. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1545), 1335–1347. https://doi.org/10.1098/rstb.2009.0302

Bejan, A., & Zane, J. P. (2012). *Design in nature: How the constructal law governs evolution in biology, physics, technology, and social organization*. Random House.

Billman, J. A. H. (2019). Tackling wicked problems in the field of evaluation (Publication No. 27546258). [Doctoral dissertation, Indiana University of Pennsylvania], ProQuest Dissertations and Theses Global.

Billman, J. A. H. (2022). Framing evaluation in reality: An introduction to ontologically

integrative evaluation. *American Journal of Evaluation.* Advance online publication. https://doi.org/10.1177/10982140221075244

Benally, H. J. (1992). Spiritual knowledge for secular society: Traditional Navajo spirituality offers lessons for the Nation. *Journal of American Indian Higher Education*, *3*(4). https://tribalcollegejournal.org/spiritual-knowledge-secular-society-traditional-navajo-spirituality-offers-lessons-nation/

Beresford, M. J. (2010). Medical reductionism: Lessons from the great philosophers. *QJM: An International Journal of Medicine*, *103*(9), 721–724. https://doi.org/10.1093/qjmed/hcq057

Beringer, A. (2006). Reclaiming a sacred cosmology: Seyyed Hossein Nasr, the perennial philosophy, and sustainable education. *Canadian Journal of Environmental Education*, *11*, 26–42. https://eric.ed.gov/?id=EJ881793

Bristow, W. (2011). Enlightenment. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Summer 2011 ed.). https://plato.stanford.edu/archives/sum2011/entries/enlightenment

Browne, A. (1977). Descartes's dreams. *Journal of the Warburg and Courtauld Institutes*, *40*, 256–273. http://www.jstor.org/stable/750999

Brown, V. A., Harris, J. A., & Russell, J. Y. (Eds.). (2010). *Tackling wicked problems through the transdisciplinary imagination*. Earthscan Routledge.

Bullivant, S., Farias, M., Lanman, J., & Lee, L. (2019). *Understanding unbelief: Atheists and agnostics around the world*. St. Mary's University Twickenham London. https://www.stmarys.ac.uk/research/centres/benedict-xvi/understanding-unbelief.aspx

Cajete, G. A. (2000). *Native science: Natural laws of interdependence*. Clear Light Publishers.

Campbell, M. B. (2013). The inner eye: Early modern dreaming and disembodied sight. In A.M. Plane & L. Tuttle (Eds.), *Dreams, dreamers, and visions: The early modern Atlantic world* (pp. 33–48). University of Pennsylvania Press. http://www.jstor.org/stable/j.ctt3fhmpt.5

Castellano, M. B. (2000). Updating aboriginal traditions of knowledge. In G. J. Sefa, B. L. Hall, & D. G. Rosenberg (Eds.), *Indigenous knowledges in global contexts* (pp. 21–36). University of Toronto Press.

Chilisa, B. (2012). *Indigenous research methodologies*. Sage.

Cohen, S. M. (2016). Aristotle's metaphysics. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Winter 2016 ed.). https://plato.stanford.edu/archives/win2016/entries/aristotle-metaphysics/Contu, A., & Girei, E. (2014). NGOs management and the value of 'partnerships' for equality in international development: What's in a name? *Human Relations*, *67*(2), 205–232. https://doi.org/10.1177%2F0018726713489999

Dawes, G. W. (2017). Ancient and medieval empiricism. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Winter 2017 ed.). https://plato.stanford.edu/archives/win2017/entries/empiricism-ancient-medieval/

Denzin, N. K., Lincoln, Y. S., & Smith, L. T. (Eds.). (2008). *Handbook of critical and Indigenous methodologies*. Sage.

Descartes, R. (2018). *Meditations on first philosophy*. (J. Veitch, Trans.). The Happy Reader Publishing. (Original work published 1641.)

Desmoulins, L. (2005/2006). Storytelling: Exploring the intersections between Western and Anishnabe research methodologies. *International Journal of Diversity in Organizations, Communities & Nations*, *5*(3), 119–126. https://doi.org/10.18848/1447-9532/CGP/v05i03/39011

Dimancescu, D., Alvarez, V., & Bouwer, N. (2015, Feb. 23). *The constructal law explained* [Interview]. Kogainon. http://www.kogainon.com/K/Pages/Bejan/Four.html

Dohn, N. B. (2014). On the necessity of intertwining 'knowledge in practice' in action research. *International Journal of Action Research*, *10*(1), 54–97. https://econpapers.repec.org/RePEc:rai:ijares:ijar-2014-01-dohn

Duijs, S. E., Baur, V. E., & Abma, T. A. (2019). Why action needs compassion: Creating space for experiences of powerlessness and suffering in participatory action research. *Action Research*, *0*(0), 1–20. https://doi.org/10.1177%2F1476750319844577

Ellwood, C. (1902). Aristotle as sociologist. *The Annals of the American Academy of Political and Social Science*, *19*, 63–74. https://doi.org/10.1177%2F000271620201900204

Ermine, W. (2007). The ethical space of engagement. Indigenous Law Journal, *6*(1), 194–203. https://jps.library.utoronto.ca/index.php/ilj/article/view/27669

Ferguson, M. A., Nielsen, J. A., King, J. B., Dai, L., Giangrasso, D. M., Holman, R., Korenberg, J. R., & Anderson, J. S. (2018). Reward, salience, and attentional networks are activated by religious experience in devout Mormons. *Social Neuroscience*, *13*(1), 104–116. https://doi.org/10.1080/17470919.2016.1257437

Ferguson, M. A., Schaper, F. L. W. V. J., Cohen, A., Siddiqi, S., Merrill, S. M., Nielsen, J. A., Grafman, J., Urgesi, C., Fabbro, F., & Fox, M. D. (2021). A neural circuit for spirituality and religiosity derived from patients with brain lesions. *Biological Psychiatry*, *9*(4), 380–388. https://doi.org/10.1016/j.biopsych.2021.06.016

Freire, P. (2018). *Pedagogy of the oppressed* (50th anniversary ed.). Bloomsbury Publishing Inc. (Original work published in 1970.)

Gabbey, A., & Hall, R. E. (1998). The melon and the dictionary: Reflections on Descartes's dreams. *Journal of the History of Ideas*, *59*(4), 651–668. https://doi.org/10.1353/jhi.1998.0035

Gallagher, L., & Ofir, Z. (2021). The rights of nature: An emerging transformation opportunity for evaluation. *The Canadian Journal of Program Evaluation*, *36*(2), 141–161. https://doi.org/10.3138/cjpe.71575

Gaziel, A. (2012). Questions of methodology in Aristotle's zoology: A medieval perspective. *Journal of the History of Biology*, *45*, 329–352. https://doi.org/10.1007/s10739-011-9284-6

Goodchild, M. (2021). Relational systems thinking: That's how change is going to come, from our earth mother. *Journal of Awareness-Based Systems Change*, *1*(1), 75–103. https://doi.org/10.47061/jabsc.v1i1.577

Hanson, B. (2015). Objectivities: Constructivist roots of positivism. *Qual Quant*, *49*, 857–865. https://doi.org/10.1007/s11135-014-0027-6

Hatfield, G. (2018). René Descartes. In E. N. Zalta, U. Nodelman, C. Allen, & R. L. Anderson (Eds.), *The Stanford encyclopedia of philosophy* (Summer 2018 ed.). https://plato.stanford.edu/archives/sum2018/entries/descartes/

Hartrick, G. A. (2002). Beyond polarities of knowledge: The pragmatics of faith. *Nursing Philosophy, 3*, 27–34. https://doi.org/10.1046/j.1466-769X.2002.00079.x

Hopson, R., & Cram, F. (Eds.). (2018). *Tackling wicked problems in complex ecologies*. Stanford University Press.

Kapogiannis, D., Deshpande, G., Krueger, F., Thornburg, M. P., & Grafman, J. H. (2014). Brain networks shaping religious belief. *Brain Connectivity*, *4*(1), 70. https://doi.org/10.1089/brain.2013.0172

Keefer, M. H. (1996). The dreamer's path: Descartes and the sixteenth century. *Renaissance Quarterly*, *49*(1), 30–76. https://doi.org/10.2307/2863264

Keevak, M. (1992). Descartes's dreams and their address for philosophy. *Journal of the History of Ideas*, *53*(3), 373–396. https://doi.org/10.2307/2709883

Kovach, M. (2009). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto Press.

Laker, M. K. (2015). Religious experiences and mind-brain sciences in the 21st century. *Activitas Nervosa Superior*, *57*(1), 34–41. https://doi.org/10.1007/BF03379622

Lavellée, L. F. (2009). Practical application of an Indigenous research framework and two qualitative Indigenous research methods: Sharing circles and Anishnaabe symbol-based reflection. *International Journal of Qualitative Methods*, *8*(1), 21–40. https://doi.org/10.1177%2F160940690900800103

Leroi, A. M. (2014). *The lagoon: How Aristotle invented science*. Penguin Books.

Lewontin, R. (2000). *The triple helix: Gene, organism, and environment*. Harvard University Press.

Lovanio, K. & Wallace, M. (2007). Promoting spiritual knowledge and attitudes: A student nurse education project. *Holistic Nurse Practice, 21*(1), 42-47. https://doi.org/10.1097/00004650-200701000-00008

Maxwell, T. P. (2003) Integral spirituality, deep science, and ecological awareness. *Zygon: Journal of Religion & Science*, *38*(2), 257–276. https://doi.org/10.1111/1467-9744.00499

Mazzocchi, F. (2006). Western science and traditional knowledge. *EMBO*, *7*(5), 463–466. https://doi.org/10.1038/sj.embor.7400693

Mensky, M. B. (2014, November). Quantum reality explains mystical powers of consciousness. *Dialogo: Proceedings of the Conference on the Dialogue Between Science and Theology*, *1*(1), 76–79. http://dialogo-conf.com/archive/?vid=1&aid= 1&kid= 170101

Meredith, P., Murray, J., Wilson, T., Mitchell, G., Hutch, R. (2012). Can spirituality be taught to Health care professionals? *Journal of Religion and Health, 51*, 879-889. https://doi.org/10.1007/s10943-010-9399-7

Mertens, D. M., Cram, F., & Chilisa, B. (Eds.). (2016). *Indigenous pathways into social research*. Routledge.

Mucina, D. D. (2011). Story as methodology. *AlterNative: An International Journal of Indigenous Peoples*, *7*(1), 1–14. https://doi.org/10.1177%2F117718011100700101

Neeganagwedgin, E. (2013). Ancestral knowledges, spirituality and Indigenous narratives as self-determination. *AlterNative: An International Journal of Indigenous People*, *9*(4), 322–334. https://doi.org/10.1177%2F117718011300900404

Neuenschwander, E. (2013). Qualitas and quantitas: Two ways of thinking in science. *Qual Qant*, *47*, 2597–2615. https://doi.org/10.1007/s11135-012-9674-7

Newman, L. (2016). Descartes' epistemology. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Winter 2016 ed.). https://plato.stanford.edu/archives/win2016/entries/descartes-epistemology/

Parry, R. (2014). Episteme and technê. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Fall 2014 ed.). https://plato.stanford.edu/archives/fall2014/entries/episteme-techne/

Pierotti, R. (2011). *Indigenous knowledge, ecology, and evolutionary biology*. Routledge.

Pierotti, R. (2015). Indigenous concepts of 'living systems': Aristotelian 'soul' meets Constructal Theory. *Ethnobiology Letters*, *6*(1), 80–88. https://doi.org/10.14237/ebl.6.1.2015.420

Puebla, C. A. C. (2016). The onward journey. In D. M. Mertens, F. Cram, & B. Chilisa (Eds.), *Indigenous pathways into social research* (pp. 395–402). Routledge.

Riggs, E. M. (1998). Toward an understanding of the roles of scientific, traditional, and spiritual knowledge in our "demon-haunted world." *American Indian Culture and Research Journal*, *22*(1), 213–226. https://doi.org/10.17953/aicr.22.1.4311l8235u702738

Roos, V. (2012). The Mmogo-Method™: An exploration of experiences through visual projections. *Qualitative Research in Psychology*, *9*, 249–261. https://doi.org/10.1080/14780887.2010.500356

Schaefer, J., Stonecipher, S., & Kane, I. (2012). Finding room for spirituality in healthcare. *Nursing*, *42*(9), 14–16. https://doi.org/10.1097/01.nurse.0000418624.06842.97

Scriven, M. (1966). *Primary philosophy*. McGraw-Hill.

Scriven, M. (1980). Self-referent research. *Educational Researcher*, *9*(6), 11–30. https://doi.org/10.3102%2F0013189X009004007

Scriven, M. (2010, April 20). *Michael Scriven on "Rethinking all of evaluation"*. Genuine Evaluation. https://web.archive.org/web/20210128221733/http:/genuineevaluation.com/rethinking-all-of-evaluation/

Shemsedin, W. (2016). *The idea of transmodern Ethiopia: A perspective from philosophy and ethics of liberation*. [Unpublished master's thesis]. Addis Ababa University.

Simpson, L. (2000). Stories, dreams, and ceremonies – Anishinaabe ways of learning. *Tribal College Journal*, *11*(4), 26–30. https://tribalcollegejournal.org/stories-dreams-ceremonies-anishinaabe-ways-learning/

Singh, M., & Major, J. (2017). Conducting Indigenous research in Western knowledge spaces: Aligning theory and methodology. *Australian Educational Researcher*, *44*, 5–19. https://doi.org/10.1007/s13384-017-0233-z

Smith, N. K. (1963). *New studies in the philosophy of Descartes*. Macmillan & Co. Ltd.

Snively, G., & Williams, W. L. (2019). Chapter 1 – Braiding Indigenous science with Western science. In G. Snively & W. L. Williams (Eds.), *Knowing home: Braiding Indigenous science with Western science* (Book 1, Version 1.1, pp. 2–11). University of Victoria.

Sols, F. (2013). Can science offer an ultimate explanation of reality? *Pansamiento*, *69*(261), 685–699. https://www.researchgate.net/publication/287435773_Can_science_offer_an_ultimate_explanation_of_reality

Steingard, D. S. (2005). Spiritually-informed management theory: Toward profound possibilities for inquiry and transformation. *Journal of Management Inquiry*, *14*(3), 227–241. https://doi.org/10.1177%2F1056492605276841

Sumner, J. (2008). Protecting and promoting Indigenous knowledge: Environmental adult education and organic agriculture. *Studies in the Education of Adults*, *40*(2), 207–223. https://doi.org/10.1080/02660830.2008.11661566

Tangenberg, K. (2000). Marginalized epistemologies: A feminist approach to understanding the experiences of mothers

with HIV. *Affilia: Journal of Women and Social Work*, *15*(1), 31–48. https://doi.org/10.1177%2F08861090022093 813

Traore, I. H. (2016). Indigenous researcher's thoughts: An experience from research with communities in Burkina Faso using participatory methods. In D. M. Mertens, F. Cram, & B. Chilisa (Eds.), *Indigenous pathways into social research* (pp. 171–188). Routledge.

Turton, C. L. R. (1997). Ways of knowing about health: An aboriginal perspective. *Advances in Nursing Science*, *19*(3), 28–36. https://doi.org/10.1097/00012272-199703000-00004

Waapalaneexkweew (N. R. Bowman-Farrell, Mohican/Lunaape). (2018). Looking backward but moving forward: Honoring the sacred and asserting the sovereign in Indigenous evaluation. *American Journal of Evaluation*, *39*(4), 543–568. https://doi.org/10.1177/1098214018790412

Wallace, M., Campbell, S., Grossman, S. C., Shea, J. M., Lange, J. W., & Quell, T. T. (2008). Integrating spirituality into undergraduate nursing curricula. *International Journal of Nursing Education Scholarship, 5*(1), 1-15. https://doi.org/10.2202/1548-923X.1443

Watson, J. (2009). Science, spirituality and truth: Acknowledging difference for spiritual dialogue and human well-being. *International Journal of Children's Spirituality*, *14*(4), 313–322. https://doi.org/10.1080/13644360903293531

Webb, M. (2017). Religious experience. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Winter 2017 ed.). https://plato.stanford.edu/archives/win2017/ entries/religious-experience/ https://plato.stanford.edu/archives/win2017/ entries/religious-experience/

Weatherdon, M. S. (2017). Indigenous knowledge and contested spirituality in Canadian nuclear waste management. *Journal for the Study of Religion, Nature and Culture*, *11*(1), 86–108. https://doi.org/10.1558/jsrnc.27263

Wilson, S. (2008). *Research is ceremony: Indigenous research methods*. Fernwood Publishing.