INTELLECTUAL AND EXPERIENTIAL KNOWING: AN EXPLORATORY FACTOR ANALYSIS TO UNCOVER THE UNDERLYING STRUCTURE OF KNOWING

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ABSTRACT

Knowledge and the acquisition thereof have long been debated throughout human history. Several authors have suggested that knowing and knowledge differ among people. However, there is consistency among these studies that suggests a dualism within Western philosophy where a person exists of a mind and a body—two distinct and separate entities—with the mind as the central point of knowing. The theoretical framework for this study suggests that the dualism representation is limiting. Further, it posits that the body is also a central point for knowing. Hence, the Ways of Knowing Scale (WoKS) was developed in an attempt to measure the two separate ways of knowing through two subscales: experiential knowing (EK) and intellectual knowing (IK). This study serves as a presentation of the theoretical and philosophical framework for the WoKS as well as a pilot study and psychometric analysis. Exploratory factor analysis (EFA) was implemented using data collected from a sample of n = 686 respondents on an initial pool of 22 items. Each of these items was constructed to reflect one of the two proposed constructs, hence two subscales (11 items per subscale). Although two constructs were originally hypothesized, a three-factor solution exhibited the closest approximation to simple structure; further, the three factors provided the most interpretable and meaningful solution. Two of the factors appear to correspond to the two original constructs suggested by theory. The various potential explanations for this third factor are considered. Future research is needed to further explore the nature of this emergent factor and subsequently refine the WoKS.

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CHAPTER I: INTRODUCTION

Knowledge and the acquisition thereof have long been debated throughout human history. A number of authors have suggested that knowing and knowledge differ among people (e.g., Baxter-Magolda, 1992, on gender differences; Adams, Tapestry Institute, n.d., on indigenous ways of knowing; Kolb, 1984, on experiential learning; Perry, 1968, on intellectual and ethical development, Gardner, 1983, on multiple intelligence, Freiler, 2008, on learning through the body, to name a few). However, there is consistency among these studies, that often reflect a dualism within Western philosophy were a person exists of a mind and a body (Johnson, 2008; Lakoff, & Johnson, 1999), where the mind and body are distinct separate entities, with the mind as the central point of knowing.

Theoretical Rationale and Need for the Study

The theoretical frameworks for this study emerge from the works of Dawn Adams and the Tapestry Institute on Indigenous people's ways of knowing. The Tapestry Institute (Adams, 1999) suggests the ways in which we come to know are not separated into discrete categories but are rather more integrated reflecting a much more appropriate understanding of the world. In contrast, contemporary Western culture views knowing as primarily expressed through intellectual ways of knowing and is privileged as the standard of knowing within the Western systems of education, particularly within the academy.

The framework suggests that in the privileging of intellectual knowing, Western culture has developed a misplaced value on the concreteness of rationality, and the analytical process often represented within the principles of mathematics and reductionism. In some ways, this philosophy of knowing has produced a fallacy of capturing an ultimate reality that has been labelled as *Truth*. "Misplaced concreteness, to be more specific, entails the elimination of a great

deal of phenomena from consideration in the formulation of theory and the consequent belief that because the theory as constituted seems to work, the neglected data is not critical to the understandings and may thereafter be excluded" (Deloria, 1979, p. 51). The heavy acceptance of intellectual knowledge and the principles of reductionism inherent within contemporary science philosophy has caused an exclusion of other ways of knowing limiting and even fragmenting how we come to know the nature of the world.

Shiva (1993) suggests as a metaphor for this fragmentation the practice of forestry and agriculture. The reductionist modes of Western scientific forestry and scientific agriculture separated the plant ecosystem into two distinct domains; these domains became based on the commodity market for which the domains supplied raw material and resources (e.g., forestry reduced to wood and agriculture reduced to food). As both Shiva and Adams suggest for indigenous people these domains are not separated, "The forest and the field are in ecological continuum, and activities in the forest contribute to the food needs of the local community, while agriculture itself is modelled on the ecology of the forest." (Shiva, 1993, p. 4). In the reduction and separation of these fields, the ecology of the forest is modelled on the market commodity of wood—agriculture on food—excluding indigenous systems of knowledge that emerged from the forest as food.

The principles of reductionism, "verificationism, falsificationism were all based on the assumption that unlike traditional, local [Indigenous] beliefs of the world, which are socially constructed, modern scientific knowledge was thought to be determined without social mediation" (Shiva, 1993, p. 3). However, Western knowledge traditions are not independent of a local knowledge system with its own bias in culture. "It is not universal in an epistemological sense. It is merely the globalised version of a very local and parochial tradition. Emerging from

a dominating and colonising culture, modern knowledge systems are themselves colonising" (Shiva, 1993, p. 2).

The power and control inherent within the colonizing system produced a set of values and beliefs based on power (Shiva, 1993). The history of colonialism is based in economic control and exploitation, and the rise of commercial capitalism fit well with the values of power. "It generates inequalities and domination by the way such knowledge is generated and structured, the way it is legitimised and alternatives are delegitimised, and by the way in which such knowledge transforms nature and society" (Shiva, p. 3).

The theoretical framework for this study, therefore, is based on the notion that Western culture has been historically built on the foundation of Intellectual knowing. Within this cognitive, reductionist knowledge structure, we have fragmented the ways that the academy explores knowing. However, humans naturally have informed ways of knowing that exist beyond the defined intellectual structure of knowledge. Furthermore, humans use these ways of knowing in their lives daily. Thus, a psychometric scale was developed to evaluate the properties of the ways of knowing instrument based on the theoretical framework adapted from Adams (1999).

Problem Statement

There has been research done to explore knowing, and much of this research suggest that knowledge is complex and differs among people (Adams, 1999; Baxter-Magolda, 1992; Freiler, 2008; Gardner, 1983; Kolb, 1984; Perry, 1968). However, contemporary research continues to be based on the principals of intellectual knowing, where the mind exists of certain knowledge (Tanaka, 2013). Derived from Descartes, the mind-body dualism is one where to understand

reality we must "withdraw the mind from the body" (Descartes as cited by Hatfield, 2016). In other words, the mind is the sole place of knowledge.

Experiential knowing as defined by embodied knowledge is widely misunderstood, though present in many works within phenomenology and psychology as well as present in alternative knowledge systems. As described previously, alternative knowledge systems including embodied knowledge have largely been misunderstood or removed from Western knowledge structure altogether. It is in this removal and the globalization of Western intellectualism and reductionism that becomes labeled as truth that Western science has become sacred and above scrutiny, but also deeply fragmented. Contemporary analysis of knowing has been focused too much on intellectual knowing, as a result there is no measurement instrument to verify the underlying structure of the theoretical constructs of Intellectual and Experiential knowing.

Purpose of the Study

Intellectual and Experiential knowing are two constructs in an integrated theory of knowing. The purpose of the study is to explore the underlying structure of the constructs of Intellectual and Experiential knowing. In Western ways of knowing, there is a tendency to compartmentalize and separate knowing (Adams, 1999; Toulmin, 2003), with primacy placed on intellectual knowing as the purest form of knowing.

Intellectual knowing within the literature is well established; however, experiential knowing as embodied knowing, is relatively young and still emerging as a philosophy of knowing. To this end, it is critical to define these constructs and test the measurement scales used in exploring the constructs further. This integrated way of knowing is a new way to understand human knowing. This study calls for future exploration on the complexities and the

fragmentation of knowing. Further, this study brings into question the longstanding assumptions of knowing held within Western knowledge systems.

Research Questions

There are three main research questions that underlie this study:

Question 1

Can the constructs described by the given theoretical framework as experiential and intellectual knowing be operationally defined and measured psychometrically in individuals?

Question 2

What are the psychometric characteristics of this instrument?

Question 3

What implications does the resulting factor structure have for the given theoretical framework?

Definition of Terms

Intellectual Knowing: "Intellectual knowing is accomplished by the brain through thinking processes like analysis, pattern recognition, and generalization" (Adams, 1999). In this definition the mind is the center of knowing and the body is often referred to as a tool for knowing.

Experiential Knowing: Knowledge in which the body knows how to act (Tanaka, 2013). In this definition the body is not just simply a tool for knowing but is the center of knowing.

Contents of the Manuscript

The literature review (Chapter II) consists of an overview of the United States educational development and philosophical foundations for contemporary Western knowledge structure. The discussion will highlight how philosophy, history, and power have contributed to

a fragmentation of knowledge. Through a discussion on history and power, the literature will focus on the ways in which knowledge is generated, structured, legitimized, and delegitimized.

Methods (Chapter III) follows the literature review and provides a general outline of the proposed analytical approach. This also establishes a framework for the results and discussion (these will be Chapters IV and V, respectively).

CHAPTER II: REVIEW OF THE LITERATURE

There are multiple ways of knowing that are meaningful for the diverse experiences and cultures that are present in the world. Numerous authors have suggested that the concepts of knowing and knowledge differ among people based on a variety of dimensions, such as gender differences (Baxter-Magolda, 1992), indigenous and cultural ways of knowing (Adams, Tapestry Institute, n.d.), experiential learning (Kolb, 1984), intellectual and ethical development (Perry, 1968), multiple intelligence (Gardner, 1983), and learning through the body (Freiler, 2008). However, Western culture has a tendency to value specific ways of knowing over others (Toulmin, 2003). This literature review is broken down into three main sections. First, the literature will discuss the philosophical foundations that contribute to modern Western knowing. Second, a focus on the history, power, and privilege of the United States education, particularly looking at hegemony within the system of education and how intellectual knowledge has been privileged. Finally, the literature will focus on the discourse of dualism and the dichotomization of experiential and intellectual knowledge.

Philosophy of Knowing

Educators, philosophers, scholars, clergy, and scientist have long sought to define the nature of knowledge and to understand how one comes to *know*. The knowledge has long been debated and early works have defined knowing vaguely, referencing a spiritual and bodily way of knowing, often tied to context-specific religion and politics of the region and era. Despite the limitations of early works on knowing, Western thought owes a great deal to works in philosophy. Often these works of philosophy are discussed in topics such as metaphysics, ontology, and epistemology with some of the earliest written portrayals of knowledge dating back to the Ancient Greek philosophers.

Socrates, despite haven written nothing, remains one of the "founding fathers" within the field of philosophy and certainly played a major role in the questioning of knowledge and knowledge acquisition (e.g., the Socratic method) as well as modern Western thought. Today a heavily favored method of teaching, the "Socratic Method" references the belief in leading students to learning through questioning, where learning comes from understanding what a student believes at the beginning (Govier, 1997). For Socrates, the starting point is critical in any argument or debate. Socrates uses argument and debate to show contradictions or prove error. Though we have come to know Socrates through second hand works, it is clear that Socrates has influenced Western thought.

There are three primary ways we have come to know Socrates; Aristophanes, Xenophon, and Plato. Aristophanes was a playwright that wrote a comedic play using Socrates, while it may highlight some aspects of Socrates, Xenophon and Plato are often preferred sources (Kraut 2015). Xenophon, a soldier-historian, stated, "I was never acquainted with anyone who took greater care to find out what each of his companions knew" (Memorabilia 4.7.1 as cited by Nails, 2014, para. 12). Plato confirms Xenophon's statement by illustrating in his dialogues Socrates' adjustment in the types of questions he asks based upon the individual with whom he is speaking. Socrates cares very deeply about where and individual starts at the outset of conversation or argument, this can be seen in Plato's dialogue, *Crito*. In this dialogue, Socrates is in jail and his friend Crito was trying to persuade Socrates to escape. Prior to forming an argument, Socrates takes great care to ask questions to make sure that he and Crito were starting from the same point (Govier, 1997). It is in this example that one can see what is termed *The Socratic Problem.* Socrates' ability to connect with those around him might explain the

differences between Xenophon and Plato's Socrates or any other person for that matter who wrote about Socrates.

Plato—Socrates most famous students and one of the primary sources of how we know Socrates—questioned knowledge indicating that how we understand the world is flawed or in error because of our senses (Kraut, 2015). To have genuine knowledge one must transcend the senses. For Plato, the soul is encumbered by the existence of the body. This corporeal attachment encumbers our grasp of nature (Govier, 1997; Kraut, 2015). Plato consider the knowledge of the material world unreliable because it is known through the senses, which are unreliable. Although Plato understood that many people had diverse ways in which they pursued truth, Plato believed in an ultimate truth that existed in an unchanging spiritual realm.

One of Plato's major contributions was the introduction of dualisms (e.g. soul/body, thought/sensation, reason/emotion, intellect/imagination, form/matter, knowledge/opinion, to name a few) to Western philosophy. Plato at times exaggerated these contrasts often putting the duality at odds with each other rather than exploring the areas were the dualisms might be viewed as integrated or rather not be at odds with each other. (Govier, 1997). Further, the dualities were judged in a way that one side was placed higher or better than the other, "soul over body, thought over sensation, reason over emotion, intellect over imagination, form over matter, knowledge over opinion. These dichotomies, and the value judgement that accompany them, have been fundamental in much subsequent Western thought" (Govier, 1997, p. 38).

Plato also made a significant impact on religious thought in his later work *Timaeus*. In this work, Plato wrote about the creation of the world, in which God was a rational minded creator. For Plato's God, the divine was developed in order, not disorder. Influenced by the work of Pythagoras, Plato shared a world that was designed by numbers, that was defined in

geometrical shapes and mathematical order (Herman, 2014). This notion of a rational God would be later used among early Christians to establish a link between "spiritual-theological and rational-scientific elements of the old testament and *Timaeus*…as one coherent system we still call Intelligent Design" (Herman, 2014, p. 36). Plato often expressed that God was always doing geometry and "where there is number there is order; where there is no number there is nothing but confusion, formlessness, and disorder" (Herman, 2014, p. 36). This expression would have lasting effect on later scholars, Copernicus, Kepler, Galileo, Newton and Einstein (Herman, 2014).

Unlike his teacher and predecessor (and rival) Plato, Aristotle embraces senses, indicating that they impart put us in contact with the world. "All men by nature desire to know. An indication of this is the delight we take in our senses" (Aristotle, Metaphysics as cited by Herman, 2014). For Aristotle, our senses are relatively dependable, and we should not waste time questioning initial appearances of the world but rather begin reflecting on those appearances and review what has been explored to date (Shields, 2015). Aristotle believes that it would be great if we could be certain of mathematical truths, or to know a priori. Like Plato, Aristotle believed in an ultimate truth or universal pattern. However, in Aristotle's work the most important knowledge comes a priori, from linking experiences or those leading to cause (Herman, 2014). For Aristotle, the process began through the most basic way in which we know the world, the senses, and moved from awareness to recognition of the universal pattern, Aristotle called this induction (Govier, 1997). Through Aristotle's experiences reason always came after experience, knowledge was empirical. This allowed for individuals to sorting through the experience and make meaning and connect patterns. The process of sorting through the experience become knowledge as certain as the knowledge of Plato (Herman, 2014).

Aristotle's contribution to modern science was immense. Considered the father of biology, Aristotle's work covered "biology, zoology, gerontology, physics, astronomy, meteorology (meaning the study of meteors and comets), politics, and psychology, not to mention logic and metaphysics" (Herman, 2014, p. 45). For Aristotle, biology was true science and was represented in the process of observation, collection, and classification of specimens to compare similarities and differences (Herman, 2014). From a cultural stand point this focus has largely impacted Western society, as we tend to classify much of our world, race, ethnicity, gender, so on.

What is particularly celebrated in Aristotle's work is logic. Aristotle's work on logic represents the earliest formal written study. What is even more impressive is that Aristotle's work was developed so well it was largely untouched for centuries, "Kant, who was ten times more distant from Aristotle than we are from him, even held that nothing significant had been added to Aristotle's views in the intervening two millennia" (Shields, 2015, para. 1).

Descartes believed that human beings know to some extent and have the ability to come to know. However, Descartes largely rejected Aristotelian philosophy stating, "All that up to the present time I have accepted as most true and certain I have learned either from the senses or through the senses, but it is sometimes proved to me that these senses are deceptive, and it is wiser not to trust entirely to anything by which we have once been deceived" (Descartes, 1641, 1-7 translated by Elizabeth S. Haldane). Similar to Plato, Descartes argued that how one comes to know is flawed because human knowledge of reality is produced through senses. Descartes rejected that senses reveal the true elements of nature and suggested that humans have the ability to understand reality purely through intellectual perception or as Descartes indicates to

understand reality we must "withdraw the mind from the body" (Descartes as cited by Hatfield, 2016).

Descartes believed to be certain of any knowledge, we should doubt all that we believe we know:

> …since book-learning…has been made up, and has developed gradually, from the opinions of many different men, it is therefore not so close to the truth as the simple reasonings that a man of good sense may preform…Again, I reflected, we were all children before we were men; we must have been governed a long time by our own appetites on the one hand and our preceptors on the other; these two sides must frequently have been opposed, and very likely there have been times when neither side urged us to the best course. Thus it is practically impossible for our judgements to be so clear or so firm as they would have been if we had had the full use of our reason from the moment of birth, and had never had any other guide. (Discourse on Method, Part Two, 16, as cited by Govier, 1997, p. 79)

For Descartes, skepticism of knowing was central to pure reasoning. With knowledge interpreted by many people each with their own influences and guiding principles nothing can be absolutely pure. Since we were not born with reason, we necessarily were dependent and had to place trust in others on what is truth.

Descartes believed that senses and interpretation were flawed ways of knowing. Instead Descartes opted for the truths of arithmetic and geometry which are not flawed by senses. "For whether I am awake or asleep, two and three added together are five, and a square has no more than four sides. It seems impossible that such transparent truths should incur any suspicion of being false" (First Meditation, 14 as cited by Govier, 1997, p. 82). Descartes' work certainly influenced Western thought, as mathematics is synonymous with scientific in today's academy. The relationship of math and science represents the views of a mechanical world one that is governed by universal truths and laws that can be discovered through the control of bias and understanding the flaws in sense data.

Kant furthered the work of Aristotle when he wrote the *Critique of Pure Reason*, often considered the most influential works in the area of philosophy. This particular work established the binary of knowledge that currently exists in Western traditions—that is, a priori knowledge (that which is independent of experience) and a posteriori knowledge (that which is gained through experience and framed around synthetic and analytic statements or judgements).

During Kant's time rationalism and empiricism were being heavily debated. Rationalists believed that knowledge was created through reason and was purely intellectual. Kant rejected rationalist metaphysics, arguing that "concepts and structures of our minds are only guaranteed to apply to what we experience. We never experience God, life after death, the world as whole, or the moment of Creation; hence we can have no knowledge of these things" (Govier, 1997, p. 165). Empiricists argued that knowledge was only understood through experience. Empiricists thought of the mind as passive, just receiving senses. Kant rejected this arguing that the mind was active. The mind imposes structure or ordering to senses allowing for stability. In this world of stability, "events are related to each other in law-like, predictable ways" (Govier, 1997, p. 165).

> Without sensibility no object would be given to us, without understanding no object would be thought. Thoughts without content are empty, intuitions [single representations] without concepts are blind…The understanding can intuit nothing, the senses can think nothing. Only through their union can knowledge arise. (A52, B76, 93, as cited by Govier, 1997, p. 163)

Kant suggested that concepts within Empiricism and Rationalism can be considered together in universal principles, rules, and laws. To have knowledge "we need both sensibility (which had been emphasized by the empiricists) and understanding (which had been emphasized by the rationalists)" (Govier, 1997, p. 163).

It is clear that the dichotomy of knowledge has been philosophized for millennia. While this literature review could explore more epistemological studies for the purposes of brevity

these philosophers highlight the great history of debate surrounding knowledge and knowledge acquisition. However, to understand the impact these scholars had on higher education within the United States we need to explore some of the history of the development of higher education.

History, Power, and Privilege

History of U.S. Education

History is a multifaceted tool that can be used to strengthen one's cultural, social, and/or religions identity (Spring, 2011). It can also serve as a mixed analysis of past atrocities of power and control. The history of U.S. education is one that may cause mixed emotions. While there was certainly a number of successes and triumphant developments, there were also times where education was used to control, indoctrinate, and destroy cultures and languages (Spring, 2011). The literature review will explore that nature of power and control of educational practices within the development of the U.S. education system to illustrate the way in which Western systems of education have maintained a dichotomy of knowing.

The principles of democracy and equality are the foundation of The United States' Western knowledge system (Cohen & Kisker, 2010; Spring, 2010). Western traditions on thinking are deeply rooted and shaped by Ancient Greek philosophers—particularly with the nature of intellectual, experiential, and religious knowing—but also within the formation of U.S. education.

Paralleling the European education system, the U.S. developed systems of education based on European models, only changing out of necessity with environmental challenges in the "new world" (Cohen & Kisker, 2010). The premise became the development of "Civilized men". For Western cultures education served as a means to establish schools and religion that maintained culture and Western ways of knowing (Spring 2010). Though the principles of

democracy and equality were the foundation of The United States' Western knowledge system (Cohen & Kisker, 2010; Spring, 2010), democratic education like any education system was a product of the political regime, that sought to produce people and citizens that have the "tastes, knowledge, and character supportive of a democratic regime" (Bloom, 1987, p. 26). In the case of the colonial era, education was used to maintain law and order, respect and obedience for the colonial and religious laws (Spring, 2011).

The United States (U.S.) education system developed to serve the contexts of early colonial time. The U.S. early education system was not unique in this development. Every educational system has some belief that drives the curriculum, early U.S. education unified people on their allegiance to religious observances, with purpose to produce a society that obeyed laws and religious commandments (Spring, 2011), thus education was heavily guided by the beliefs of many of the Puritan settlers of the time.

For the colonial era, religion largely influenced the purpose of education. In New England, the Puritans valued education and literacy as a form of economic success and biblical studying. The bible was largely the only text available to families. For colonists, a just society was one of obedience to law and religious commandments (Spring, 2011). While religion continued to serve as one purpose of education, social distinction and social mobility became important aspects of education.

Control of education also became a major concern for early colonists. Freedom of thought was largely debated as some questioned the role that religion had in the development of thought within education. Others questioned the role that governments should or should not have, with the primary concern being that religion and government would control thought and thus impact freedom of thought.

Many of the debates of the colonial era are still widely discussed and challenged today. There are some that believe that education serves as of means to teach obedience to laws and civic engagement, that education is a means of social mobility, and certainly we debate the role that government should have on education.

Power and Privilege

It is clear when looking at the history of thought and the development of education that power and control were often areas of struggle for populations entering the education system within the U.S. Power and control continued to play a major role in the development of education. One cannot ignore the power and control that early education had with regards to slaves and Indigenous populations. Early education sought to limit African American access, while the appurtenance of boarding schools sought to force indigenous populations to acquire Western thought, worldviews, and religious beliefs (Barnhardt & Kawagley, 2005). Colonialists believed that Native Americans would benefit from the *civilized* culture and religious values of Christianity. An early depiction of a Native American can be seen on the seal of the Governor and Company of Massachusetts, saying "Come and help us" (Spring, 2011). "This figure held an arrow in one hand and a bow in the other; a band of leaves covered his midsection. Undoubtedly, English colonists sincerely believed they were bringing a superior culture to a 'heathen' and 'uncivilized' people. This seal symbolized the feelings of cultural superiority" (Spring, 2011, p. 12.). This is further supported by Henry Pratt, who (in)famously stated, "kill the Indian, save the man".

These attitudes of cultural superiority stemmed from a lengthy history of colonization. Colonialism was used to spread the English culture and was often thought that the only way to redeem the heathen cultures were for them to learn and adopt English culture. Paralleling ancient

Greek's continuous expansion and thought of civilizing the barbarians under one rule. Comparisons were made between the English invasion of Ireland in the twelfth century and the belief of the innate inferiority of the Irish with that of colonialism in North America, and the perspective of the Indigenous population. (Spring, 2011). During these times of colonial pushes Western ideals were pushed on non-Western cultures and while democracy was the cannon that was preached, "European nations were reluctant to grant any measure of self-government, even in a democratic sense, to the colonized nations they controlled" (Deloria, 1979, p. 2)

Educational systems were developed to convert and "civilize" Native Americans. Colonists were shocked when Native Americans resisted these systems of education. The beliefs of the inferiority of Native American culture and the view that the only way to redeem Native Americans were to teach them English culture and religious values, coupled with the resistance of Native Americans to education systems caused colonists to "engage in an educational crusade to turn 'heathen' and 'uncivilized' Indians into models of Protestant and English culture" (Spring 2011, p. 12). In the early models of education developed for Native Americans, there is a linking of religious conversion with cultural conversion. Later, the work of Eleazar Wheelock and Samson Occom advocated for the removal of Native American children from their homes and be placed in boarding schools. Within these school Native Americans were taught English, forbidden the ability to speak their language, given haircuts and dress according traditional European gender roles, and were given European names. The U.S. government would continue this practice until the passing of the Indian Child Welfare Act of 1978.

More extreme racism led to beliefs that genocide was the only option with dealing with Native Americans, particularly with those who resisted the Indian Removal Act, singed by Andrew Jackson in 1830. As Spring notes, "Extreme racist opinions led to the conclusion that

the only solution to the 'Indian problem' was genocide" (2011, p. 25). This belief continued for centuries as General Philip Sheridan commented in 1867, "the only good Indians I ever saw were dead" (Spring, 2011, p. 25).

Similarly, to Native American treatment, the brutality of plantations and the addition of slavery added another dehumanizing experience for enslaved Africans within early U.S. history. With the rise of plantations in the south, more and more slaves were being imported to the U.S. The deculturalization process was one way in which plantation owners kept control over slaves. Part of the deculturalization process was linguistic isolation and the control of education. The other way control was maintained was through the brutality of discipline.

Common Schools

In the 1830s, common school development became an increasing priority as people feared the multicultural development of the colonies that already had Native Americans, African slaves, and an increasing Irish Catholic population. The common schools were thought to bring stability and a common culture, one that preserved the Anglo-Saxon culture.

Irish immigrants were also largely seen as "savages" which stemmed from a long history of English dominance of Ireland. Treated much like Native Americans and African Americans, the Irish were greeted with hostility, out of fear that the "drunken Irish" would destroy the American Dream (Spring, 2011). "The Reverend Theodor Parker warned his congregation of 'The Dangerous Classes,' who were 'inferior in nature, some perhaps only behind us in development…a lower form…[consisting of] negroes, Indians, Mexicans, Irish, and the like" (Spring, 2011, p. 110).

The fear of protestants was that the increased number of Irish Catholic immigrants would undermine the Protestant values and derail society. The conflict was so great between

Protestants and Catholics that the common schools really did not develop as common, rather Catholics felt so excluded from the system of education that they felt they needed to create their own system. (Spring, 2011). The origins of the Catholic school system are the result of the common school conflict with Protestants, and certainly highlights the cultural infusion of schools with values of Protestantism, republicanism, and capitalism.

Racial Segregation

During the late eighteenth century, the practice of slavery was being questioned in northern states. Petitions to free slaves began appearing during the revolution. Practices were being established to prohibit the further importation of slaves with the goals to eventually eliminate the slavery altogether. In 1778, "…the governor of New Jersey called on the state legislature to begin the process of gradual abolition of slavery because it was 'odious and disgraceful' for a people professing to idolize liberty'" (Spring, 2011, p. 116).

As the process of freeing slaves became a reality it was immediately clear that the current systems of education were not going to be inclusive. In fact, any attempt for an integrated system of education was met with protest and violence. "In Canaan, New Hampshire, the Noyes Academy in 1835 admitted twenty-eight whites and fourteen African Americans…when the school year began, four-fifths of the residents of Canaan registered a protest...A mob attacked the school" (Spring, 2011, p. 118). Segregated systems were developed to support the belief in racial division, it also resulted in unequal educational opportunities and funding (Spring, 2011). Even after the civil war, there were questions of whether African Americans should even be educated, they posited that the education of African Americans would offend southerners as well as promote immigration from Africa (Spring, 2011).

Segregation and discrimination affected African Americans beyond education, as attempts to ban interracial marriages, the use of public transportation, and the development of "coloreds only" or "no coloreds allowed" certainly continued through the Civil Rights movement. As the most important domestic movement, the Civil Rights movement held strong ideological links to a new political movement that was developing around the world, particularly after the Second World War. (Deloria, 1979). Vine Deloria, Jr. provides a reasoning for this global development:

> The most important domestic movement within the Western democracies was the Civil Rights movement in the United States, which had strong ideological links with new political crusades around the globe. During the Second World War, Nazi theorists had advocated racial supremacy, which was not ideologically different from the racial theories held by most Americans. In opposing Nazism on egalitarian grounds the United States had undercut the ideological basis for its own racial practices. The Allied triumph over the Axis powers was thus a direct motivation for internal reform in race relations in the Western countries. It seemed unreasonable to deny one's own citizens those rights the Axis powers had tried to deny to all humanity (p. 12)

Western culture still struggles with this transition and is particularly evident within the last decade, if contemporary events are any indication (e.g., Black lives matter; Dakota Access Pipeline, the Presidential election of 2016).

Contemporary Critique

The history of hegemony has impacted education development. Clearly, we see the implications that this past conflict has had on access, persistence, and retention of marginalized groups of people in higher education; one could read the many article relating to such concerns that span decades (Allen, 1992; Allen, Epps, & Haniff, 1991; Bennett, 1995; Carey, 2005; Feagin, 1992; Feagin, Vera, & Imani, 1996; Fisk, 1988; Guillory, 2009; Larimore & McClellan, 2005; Watson, Terrell, Wright, & Associates, 2002). As Aronowitz indicates, "Equality of Opportunity' for class mobility is the system's tacit recognition that inequality is normative" (2004, p. 15-16).

From an idealistic standpoint, it could be argued that democracy and equality would be at odds with exclusionary practices, however, the reality is that these "hegemonic" values are infused within the educational environments, "including curriculum and textbooks [and] have remained the norm" (Swartz, 2009 p. 1048). Though, the U.S. education system was founded on the principles of democracy and equality, it can be said that these views were quixotic at best, largely due to a natural tendency to view Indigenous people and slaves as "less than" human, or more plainly stated, savages. With a clear cultural infusion of values within the education system it is not hard to see as Aronowitz indicates that, "contrary to their democratic pretensions, [schools] teach conformity to the social, cultural, and occupational hierarchy" (2004, p. 16).

The history of hegemony certainly limited alternative ways of knowing. However, some scholars are critical of this history and seek to explore how this history has been infused within the current state of education. Rather than just celebrate the pioneers of our education system, it may be more appropriate to ask, as Manning and Coleman-Boatwright (1991) do, "Whose past traditions, actions, and experiences are embraced within our institutional structures, described in the study of history, transmitted through the curricula of schools, and represented in the art and architecture of campus environments" (p. 368).

This question highlights the cultural constants expressed within institutions. Unfortunately, culture can be the crux of the problem in exploring the question posed by Manning and Coleman-Boatwright. Often the culture that is predominate, permeates within the structures of education and organizations so much that it becomes the given, what is considered normative (Manning & Coleman-Boatwright, 1991; Tierney, 1995) for which standards are based and knowledge is assessed. However, that is not to say that the United States is not able to change culturally. In fact, much of the cultural constants (even from the Civil Rights movement)

are under transformation. When we look back over the decades of the United States cultural acceptance of sexual diversity and compare them to today, we can certainly see how much we have changed (Deloria, 1979). There is a need to acknowledge that transformation is not an end in and of itself. As Vine Deloria, Jr. (1979) notes, "Change, even transformation of attitudes, is not an end in itself unless it leads to a more profound and comprehensive idea of the meaning of existence. We always run the risk of lapsing into a new and more sophisticated barbarism" (p. 8)

In higher education diversity is the term that has become used to encapsulate "otherness", or, more simply those who are not a part of the "mainstream" (Swartz, 2009). Higher education's focus on diversity has not historically included the knowledge and perspectives of marginalized groups (Swartz, 2009). In some way's "diversity" has become a buzz word that is coded as Ladson-Billings (1999) described, as "that 'thing' that is other than white and middle class" (p. 219). The effects of these views are seen more apparently within the structures and privileging of knowledge.

The Privileging of Knowing

As the opening of this literature review highlights, knowledge continues to be dictated by Western ways of knowing, though more and more researchers are beginning to question these ways of knowing. One of the implications that this education culture has had in higher education has been the acceptance and application of knowledge (i.e., what is privileged as acceptable knowledge). Within the Academy (higher education), Western modern views of knowing are principled within intellectual knowledge and are modeled from a Cartesian worldview.

Historically, Western knowledge structures have labeled non-Western systems of thought as "retrograde for having a larger cosmology embedded in mythic structures" (O'Sullivan, 1999, p. 181 as cited by Merriam & Kim, 2008, p. 72), while establishing Western scientific thinking

as the standard for superior thinking (Merriam & Kim, 2008). As highlighted previously, Western knowledge of today is a relatively recent development, spread through colonization and globalization. This knowledge system has become anchored in ancient Greek philosophy and with the spread and dominance of the Western knowledge system, alternative knowledge structures have become disregarded or outright dismissed (Merriam & Kim, 2008; Shiva, 1993). Even the use of Western and non-Western as a dichotomy highlights the dismissal of non-Western thought as it groups anything other than the Western knowledge structure as non-Western.

The historical development of U.S. education coupled with the foundational philosophy of knowing and principles of an early democracy, provided for a unique foundation for the Academy. The system that was embraced within the Academy was established by a binary knowledge structure that consisted of intellectual and experiential knowing. The binary structure is one in which, like Descartes, mind and rationalism becomes associated with intellectualism, and body and irrationalism associated with experiential knowing, or rather in Descartes views rejected as knowledge altogether. The dialectic truths became the foundation of knowledge defined by propositional statements. In so doing knowledge has become something that is to be written and reflected on, considered separate from the self. Descartes's famous maxim, "I think, therefore I am" highlights the ideology of the cognitive process, where the mind became "privileged as the site of learning and knowing" (Merriam & Kim, 2008, p. 76), as the subject of knowing (Tanaka, 2013).

In non-Western traditions, knowing is viewed more holistically. Learning and knowing involves not just the mind, but also the body and spirit, the whole being. In this view, one cannot simply separate the mind from the rest. For example, Dawn Adams with her work the on the

Tapestry Institute shares The Circle, designed after the medicine wheel of indigenous peoples within the U.S. While the center of The Circle represents the holistic integrated way of knowing, each way of knowing is identified as, intellectual, experiential, spiritual, and mythic. All the dimensions represent a harmonious way of knowing, with all ways interweaving and interconnected. For many indigenous populations, this harmonious way of knowing stems from a history of understanding the worlds interconnected patters. Relaying on the earth, animals, flora and fauna for sustenance and the observation that these ecological systems are patterns of parts within parts highlights the underpinning of Native American relationship as part of the world. Aside from the innate cultural differences to education, the history of power and control can be seen even in the modern educational experiences of Native Americans. For example, the U.S. Commission on Civil Rights produced a comprehensive report regarding the educational experiences of Native American students entitled, *A Quite Crisis: Federal Funding and Unmet Needs in Indian Country*, the following conclusion was drawn:

> As a group, Native American student are not afforded educational opportunities equal to other American students. They routinely face deteriorating school facilities, underpaid teachers, weak curricula, discriminatory treatment, and outdated learning tools. In addition, the cultural histories and practices of Native students are rarely incorporated in the learning environment. As a result, achievement gaps persist with Native American Students scoring lower than any other racial/ethnic group in basic levels of reading, math, and history. Native American students are also less likely to graduate from high school and more likely to drop out in earlier grades. (U.S. Commission on Civil Rights 2003:xi as cited by Barnhardt & Kawagley, 2005, p. 10)

Indigenous students from around the world have a shared lack of enthusiasm for the schooling experience (Barnhardt & Kawagley, 2005), given the history that Western education systems played with indigenous populations it is no wonder. Aside from the power and control that Western education systems enforced on indigenous people, the cultural difference of the West to privilege the abstract and theoretical over that of experience in holistic ways, certainly contributed to the gap's persistence (Merriam & Kim, 2008).

In contrast, Western culture tends to focus on compartmentalized knowledge system or rather the tendency is to focus on separating the secular (intellectual and experiential) from the sacred (spiritual and mythic) thus fragmenting knowledge (Deloria, 1979; Shiva, 1993; Adams, 1999; Merriam & Kim, 2008). This separation has become so defined within Western thought that the scared has become dismissed altogether and the focus of a new separation is developing within the secular knowledge structures, the separation and privileging of Intellectual knowing over Experiential knowing.

The modern academy has continued this separation and privileging within fields of study. Today's academy has moved beyond the classical studies to even more specialized abstract and theoretical knowledge. The specialization—fragmentation—of knowing has become so great within the academy that one might describe those specialists as technicians of the study, who lack a scholar's understanding of their field's broader relationship with education (Hoffman, 1985). Further, as undergraduate and graduate students engaged their education, they face professors that have limited ability to explain these broader relationships within their fields but also assume that these broader and fundamental principles have already been thoroughly explored (Deloria, 1979).

Like Descartes, Western education has valued the view of a mechanical world, one that is governed by certain laws and principles. With the right methods, control of bias, or specialization we can discover the worlds truths. This view highlights the privilege of intellectual knowledge over experiential knowledge, where cognition is privileged over the body or senses.

Intellectual and Experiential Knowing

The separation of knowing previously described is critical to Western philosophy and presents a dualism, that person exists of a mind and a body (cf. Johnson, 2008). Within this dualism, the mind and body are distinct separate entities, with the mind as the central point of knowing. This dualism reflects the tendency of Western cultures to privilege the mind. The mind and body dualism parallels intellectual and experiential knowing respectively, where intellectual is the mind and experiential is the body. Often this false dualism or dichotomy presents opposition on a continuum. This dualism has become entrenched in the history of the formation of Western education systems but to truly understand this dualism you need to define intellectual and experimental knowing.

Intellectual Knowing

Western ways of knowing encompass a very intellectual knowledge base. As Adams (Tapestry Institute, 1999) discusses, "Intellectual knowing is accomplished by the brain through thinking processes like analysis, pattern recognition, and generalization". The focus of the academy has historically been built from the ideal of rationality, that is, focused on objectivity and deduction, and built on the foundations, principles, and certainties of mathematical theory (Toulmin, 2003). In Western culture, mathematical theory is often what is attributed as "scientific" or as academic.

The epistemology of intellectualism stems from a period of enlightenment in Europe in the 16th and 17th centuries and has dominated Western schools since (Swartz, 2009). Swartz (2009) highlighted the worldview of Western culture during this Enlightenment period:

> Ontological orientations such as *individualisms, differences, competition, independence, individual rights, survival of the fittest,* and *control over nature* are evident within Western and patriarchal cultural contexts…Epistemologies related to these ontological

> orientations, are individually based, with primary reliance on reason, logic, authority, and the scientific method as the only valid ways of knowing. (p. 1050)

This worldview in turn affected the values and beliefs associated with teaching. In this worldview, the ontological practice found tenets in dividing and separating into classification systems. The model of higher education clearly highlights this division through disciplines. Thus, the practices of culture were—and still are—based on commitments to understanding difference (Swartz, 2009). It is in this commitment that we find Western culture's tendency to rank and order and to emphasize hierarchy (Gonzales & Nunez, 2014; Toulmin, 2003).

The culture of rank and order certainly influenced higher education as there is a tendency to rank and order every aspect of the system of education, to the perceived quality of education to the standards for which we evaluate learning and knowing. However, even the ontological orientation of these standards is imbedded in a culture of hegemony. For example, SAT and ACT, as well as other standardized assessments, make claims of being objective and culturally neutral, "yet the epistemologically narrow, upper-class- and race-privileged practices, related to standardized mental measures have and continue to result in group identities predicting the academic track in which students are likely to be placed" (Swartz, 2009, p. 1050). Thus, it is important, to question our tendency towards hierarchy and acknowledge the biases towards a certain cultural experience, particularly intellectual knowing and the assessments designed to place students within educational structure based on intellectual scales solely.

Western culture worldview is based on Cartesian worldview or paradigm where "man" and universe are seen as mechanical (Cajete, 2003; Swartz, 2009). This worldview has placed objectivity and rationalism, that is, intellectual knowing, as the highest expression of knowing. Predominate Western culture is dominated by intellectual knowledge, so much so that it is a given or the norm for what is considered scholarly work or defined as research within the

academy. It is not that Western culture denies outright alternative ways of knowing—though possible—it is that alternative knowing lack the intellectual premise of propositional argumentation and proof, heavily favored in logic and reason (Dods, 2004; Toulmin, 2003). The Western paradigm is defined through propositional statements, "usually written, considered true, separate from the self, and permanent" (Merriam & Kim, 2008, p. 73).

Using Adams definition, intellectual knowing is

> …referred to as rational, analytical, logical, or empirical, and that deal with the observable material work or with highly-developed abstract concepts (such as philosophy or higher mathematics). (Tapestry Institute, 1999)

More simply stated, intellectual knowing is knowledge of the mind. For Western cultures, intellectual knowing is placed at the top of the hierarchy of knowing and continues to be the standard of quality in the academy.

Experiential Knowing

It can be difficult to explore experiential ways of knowing within Western culture because of the tendency towards intellectual knowing. Thus, it is important to explore alternative knowledge systems. Among African and Indigenous cultures there are common elements, "with broadly similar and converging cultural tenets" (p. 1050) that approach knowing as more collectively and interrelated/interconnected (Swartz, 2009). It is in these two cultures that we see how knowing exists beyond that of the intellectual ways of knowing (e.g., spiritual, mythic, experiential, and collective). Exploring alternative knowledge systems, from an academic stand point can be limited due in part to the standards in journals to exemplify Western knowledge. However, this literature review will explore the discourse on experiential ways of knowing.

Experiential ways of knowing have been marginalized within Western education systems except in certain professional fields, (e.g., Education) though it is not clear that it is defined in a

non-intellectual way (i.e., experiential ways of knowing defined intellectually). Education as a field has had many years of discourse concerning theory and practice, where theory represents intellectual knowledge and practice represents a more experiential knowledge structure (see the work of Boyer, 1990; Dewey, 1904; Labaree, 2003; and the Carnegie Project on the Education Doctorate or CPED, to name a few). However, even these works operate from a Cartesian view of knowledge where the mind is the subject of knowing (Tanaka, 2013).

In exploring experiential knowing from an indigenous perspective, Adams (1999) shared that "Our brains process incoming sensory information from our eyes, ears, skin, nose, and mouth so quickly that sometimes we forget how much of what we know is perceived immediately, at initial contact." This way of knowing is hard to objectify but it is nonetheless a form of knowing that we "experience" daily. For example, the experience of walking is rarely considered and yet is something that is known. In fact, it is so deeply integrated into one's knowledge that it becomes challenging to articulate how one knows how to walk (Dreyfus & Dreyfus, 1986). Expertise in some ways mirrors this, as Dreyfus and Dreyfus (1986) have indicated:

> An expert generally knows what to do based on mature and practiced understanding. When deeply involved in coping with his environment, he does not see problems in some detached way and work at solving them, nor does he worry about the future and devise plans. We usually don't make conscious deliberative decisions when we walk, talk, drive, or carry on most social activities. An expert's skill has become so much a part of him that he need be no more aware of it than he is of his own body. (p. 30)

It is in both Adams and Dreyfus and Dreyfus that one can begin to define experiential knowledge.

Experiential knowledge as this literature discusses is knowledge belonging to the body, in the field of phenomenology, this type of knowledge is defined as embodied knowledge. Much like the example of walking that Dreyfus and Dreyfus share, riding a bicycle, talking, swimming

are all examples of embodied knowing. These experiences come through repeated bodily practice and are not "distinctly explicit or conscious", thus we fail to "articulate it as an objective designation" (Tanaka, 2013, p. 48). In contemporary Western's Cartesian view, "the mind is the knowing subject" and the body is simply a known object (Tanaka, 2013, p. 49). The simplest definition of experiential knowledge therefore is "knowledge in which the body knows how to act" (Tanaka, 2013, p. 48).

Much like Tanaka shares (2013), there needs to be more clarification among the notions of embodied knowing that exists within the literature. Following the work of Tanaka (2013) the following section will highlight and clarify the similarities and differences of contemporary notions situated around experiential knowing or embodied knowing.

Procedural Knowledge

Procedural knowledge stems from the skills required for performance of a task. The previous example of walking, riding a bicycle, talking, and swimming are reduced to their procedures. For example, people may be unable to articulate the sematic and syntactic rules of their language but when present with two phrases, many people are able to choose the correct format but are unable to explain why, indicating it "sounds right" (Lewicki, Hill, & Bizot, 1988). Embodied knowledge as is defined contains the skills required to perform a task. However, the difference between embodied and procedural knowledge is that procedural knowledge is rooted in the traditional views of psychology and cognitive science which presumes that procedures are stored in long-term memory within the brain (Tanaka, 2013), thus overlooking the embodied nature of procedure.

Knowing How/Knowing That

Ryle (1949), in Concept of the Mind, argued against the Cartesian view of mind, which referred to the dogma of the "ghost in the machine" where the mind was the ghost and the body was the machine. In this work, Ryle focuses knowing how rather that knowing that. Ryle, refers to the ghost in the machine as the dogma of the official doctrine that produced the mind-body dualism, this dualism stemming from Galileo's mechanical world view and Descartes struggles with reducing the mind to the realm of the mechanical. "When Galileo showed that his methods of scientific discovery were competent to provide a mechanical theory which should cover every occupant of space, Descartes found in himself two conflicting motives. As a man of scientific genius he could not but endorse the claims of mechanics, yet as a religious and moral man be could not accept, as Hobbes accepted, the discouraging rider to those claims, namely that human nature differs only in degree of complexity from clockwork" (Ryle, 1949, p. 8). Thus, the official doctrine became that the mind cannot be just a "variety of the mechanical" (Ryle, 1949, p. 8). Ryle (1949), in challenging this doctrine, stated:

> Rules of correct reasoning were first extracted by Aristotle, yet men knew how to avoid and detect fallacies before they learned his lessons, just as men since Aristotle, and including Aristotle, ordinarily conduct their arguments without making any internal reference to his formulae. They do not plan their arguments before constructing them. Indeed if they had to plan what to think before thinking it they would never think at all; for this planning would itself be unplanned (p.19)

Ryle challenges this doctrine by focusing on what philosophers discredited in knowing how, and by indicating that in unison the mind and body constitute knowing.

Tacit Knowledge

Tacit knowledge shares a common feature with embodied knowledge, that is, knowledge "that we cannot explicitly explain" (Tanaka, 2006, p. 50). Polanyi (1966), using the example of

the skill of bicycle riding and swimming, suggests that we can know something that is beyond our ability to explain:

> If I know how to ride a bicycle or how to swim, this does not mean that I can tell how I manage to keep my balance on a bicycle, or keep afloat when swimming. I may not have the slightest idea of how I do this, or even an entirely wrong or grossly imperfect idea of it, and yet go on cycling or swimming merrily. Nor can it be said that I know how to bicycle or swim and yet do not know how to coordinate the complex pattern of muscular acts by which I do my cycling or swimming. I both know how to carry out these performances as a whole and also know how to carry out the elementary acts which constitute them, though I cannot tell what these acts are. (p. 4)

Polanyi continues to show various examples where one knows, yet is unable to articulate knowing. Polanyi's theory of tacit knowing stems from the embodied works of Ryle, Husserl and Merleau- Ponty, however, again the embodied nature of knowing is overlooked, as the body is the instrument or object of knowing rather than the subject of knowing (Tanaka, 2006).

Embodied Cognition

Embodied cognition is an emergent area of research in response to traditional views of cognition, focusing on an embodied view of mind. The research on embodied cognition is complex and diverse, however central to embodied cognition is the view that the body influences cognition (see Shapiro, 2011; Clark, 2008; Pfeifer & Bongard, 2007; Gibbs, 2006; Varela, Thompson, & Rosch, 1991). The work and research of embodied cognition certainly overlaps that of embodiment; however, as has been previously described the foci of knowing does not lay in the body but is rather still a cognitive/mind process.

Summation

Though there are multiple ways of knowing, the dominant discourse and doctrine in Western culture positions the academy to embrace intellectual knowing while marginalizing alternative knowledge systems. Understanding the context of higher education development

within the U.S. can shed light on the foundations that have built a hierarchy of knowledge within the academy. However, it is just as critical in exploring this history to understand the context of culture.

The literature reviewed highlight the gap between knowledge that has been accepted and knowledge that has been marginalized, particularly, for marginalized populations but also in the field of education. In defining these terms through the literature review it can be possible to explore interrelated connection of Intellectual and Experiential ways of knowing more intentionally in research, while at the same time acknowledging the privilege of the hierarchical system that exists.

Extrapolated Conceptual Framework

The work of Dawn Adams certainly influenced the conceptual framework of this study. Within The Circle, Dawn Adams portrays four ways of knowing, intellectual, experiential, spiritual, and mythic. These four ways of knowing are represented as a harmonious, interwoven, and interconnected. The influence of Adams' work is present, however, the spiritual and mythic ways of knowing associated with The Circle represent sacred way of knowing where the conceptual framework for this study focuses on the profane or corporeal ways of knowing represented in the definitions for intellectual and experiential knowing (see appendix G).

CHAPTER III: METHODS

The overarching purpose of this study was to develop and test a psychometric instrument for measuring the intellectual knowing (IK) and experiential knowing (EK) constructs; this chapter is a description of the methods used to accomplish this goal. First, the sampling procedure is discussed, followed by data collection. The third section focuses on the development of instrument used. Finally, the fourth section presents the analytical procedures used.

Sampling

Participants were recruited using a convenience sample of students enrolled at a large Midwest public research university. All full- and part-time students enrolled at the university at the time of this study were eligible to participate. The sampling frame was the listserv of all students at this university enrolled at the time of distribution (fall 2018). At the time of the last census (fall 2018), there were 13,796 enrolled students both undergraduate and graduate.

Sample Demographics

Descriptive statistics for some important characteristics of the sample are reviewed here to confirm that it is roughly representative of the general population. The sample was representative of the total population, though female's responses were slightly higher in comparison to the total population.

Table 3.1.
Gender Distribution

Gender	Freq.
Female	450
Female to Male Transgender	4
Male	216
Male to Female Transgender	5
Not Sure	0
Other/Unspecified[a]	6

[a]Other/Unspecified had a fill in blank all respondents wrote in genderfluid (3) and nonbinary (3).

Table 3.2.
Race/Ethnicity Distribution

Race/Ethnicity	Freq.
Latino/a	19
American Indian Alaska Native	17
Asian	30
Black or African American	30
Native Hawaiian or Other Pacific Islander	4
White	624
Other	14

Table 3.3.
Degree Level Distribution

Degree Level	Freq.
Undergraduate -Bachelor's	443
Graduate -Master's	113
Graduate -Doctor's	105

Data Collection

Utilizing the IRB office at the university, the investigator was able to secure access to the current student email listserv. The pilot instrument was administered online via Qualtrics. All enrolled student at the university received an invitation to participate along with a link to the questionnaire. The data collection period existed for three weeks with an invitation email and two reminder emails (see Appendix A, B, C). Detailed instructions were included in the recruitment email to ensure uniform data collection. Complete instructions were also included in the online instrument along with an informed consent form (see appendix D).

Instrument

An initial pool of 28 candidate items was developed (the initial pool of all candidate items can be found in Table 3.1). Each item was developed specifically to tap either the IK construct or EK construct (14 items for each construct). Most items are the original work of the investigator, but one item was adapted directly from the Attitudes Toward Thinking and Learning Survey (ATTLS; Galotti, Clinchy, Ainsworth, Lavin, & Mansfield, 1999). The construct, Separate Knowing (reported Cronbach's alpha of .69) in their model is congruent with intellectual knowing as it was defined within the literature. For consistency on the WoK scale, the experiential instrument was designed by adapting the intellectual items to meet the definition of experiential knowing.

Response Options and Scoring

Given that the constructs being measured are defined in choices based on attitudes, beliefs, and opinions, Likert-type response options were used. Specifically, a five-point numerical rating scale was used with each item. The five response options are scored as follows: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree or disagree*, 4 = *agree*, and 5 = *strongly*

agree. This instrument was designed as a summated scale—that is, the scored responses on the intellectual items and the experiential items are summed to provide meaningful composite score for each subscale.

Content Validity

As part of the instrument development, content validity of the pool of candidate items was assessed using four subject-matter experts (SMEs). Experiential knowing (EK) and intellectual knowing (IK) items were arranged in a random order for the SMEs. The SMEs were instructed to first read through the definitions of EK and IK and then indicate which construct each candidate item appeared to reflect. SMEs could place an item in an undecided category if it were judged to be ambiguous, reflective of both target constructs (i.e., not unidimensional), or otherwise irrelevant. The SMEs were also asked to review each item and provide feedback for any confusing or concerning items.

The rating data from the SMEs were tabulated, and the proportion of SMEs agreeing with the intended (target) construct was computed for each item. Any item that received less than 75 percent agreement was eliminated from the final version of the pilot instrument. Table 3.4 shows the percent of SMEs who agreed with the intended construct for each candidate item as well as which items were omitted from the final instrument. The complete record of all SME classification ratings is provided in Appendix E. Also note that one item was randomly selected from the set of intellectual items for removal for the final instrument so that there would be an equal number of items on each subscale.

Table 3.4.
Initial Pool of Candidate Items with SME Ratings (k = 28)

Item stem	SME agreement	Utilization in pilot
Experiential knowing		
At work it is most important to know how we do what we do.	50%	E
I prefer to learn through experience.	100%	R
In my educational field, I value learning practical application.	100%	R
I understand best by doing.	100%	R
When I am confronted with a problem, I want to know how to solve it.	25%	E
When I meet someone for the first time, I can sense how well we will get along.	100%	R
I learn best by using my hands.	100%	R
When learning a new task in my job, I prefer to physically engage in how to do it.	75%	R
I evaluate an argument by understanding the context of the argument.	25%	E
Without practical experience, book knowledge is insufficient.	100%	R
When starting a task, I prefer to jump in right away.	100%	R
When I see something for the first time, I want to know its practical application.	75%	R
I value the use of experience in solving problems.	75%	R
When learning a task at home, I prefer to learn by doing.	75%	R
Intellectual knowing		
When I am confronted with a problem, I prefer to think about the steps to solve the problem.	75%	E[a]
When starting a task, I prefer develop steps to accomplish the task.	50%	E
It is important for me to be as objective as possible when learning something for the first time.	75%	R
I prefer to meet people that think logically.	75%	R
At work, it is important that I know why we do what we do.	100%	R
I evaluate an argument based upon facts.	100%	R
When learning how to home repair, I prefer to read about how to do it.	50%	E
In the classroom it is important that I know why we do what we are learning.	75%	R
In my educational field, I value the theories of the field.	100%	R
When learning a new task in my job, I prefer to read how to do it.	75%	R
When I am confronted with a problem, I tend to think about why the problem exists.	100%	R
I understand best through reading.	100%	R
I value the use of logic and reason in solving problem.[b]	100%	R
I prefer to gain knowledge through reading.	75%	R

Note. E = item eliminated; R = item retained. Items eliminated from the final version of the pilot instrument if SME agreement was less than 75%.

[a] Although this item met the basic criterion for inclusion in the pilot instrument, it was selected at random to be omitted in order to have an equal number of items in each subscale. [b] This item was revised based upon feedback from SMEs. The revised version of this item used in the pilot instrument can be found in Table 4.1.

Data Analysis

Exploratory factor analysis (EFA) based on the common-factor model was employed for the purposes of construct validation. Subscales corresponding to meaningful constructs were subsequently subjected to reliability analysis using Cronbach's alpha. All quantitative analyses were conducted with Stata (version 15).

CHAPTER IV: RESULTS

The overarching purpose of this study was to explore the underlying quantifiable dimensions of the conceptual structure of experiential ways of knowing and intellectual ways of knowing. To this end, the Ways of Knowing (WoK) instrument was constructed in an attempt to measure these two constructs. The pilot questionnaire contained two 11-item subscales—one for each construct. All 22 items were scored with a five-point Likert-type numerical rating scale. The five response options are scored as follows: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree or disagree*, 4 = *agree*, and 5 = *strongly agree*. The instrument was administered using an online survey tool (Qualtrics).

The final version of the pilot instrument (including the item identifier codes to be used in the remainder of this manuscript) is provided in Table 4.1 as a convenient reference. Note that each item identifier code begins with a three-letter stub (EXP or INT) indicating the target construct that the item was designed to measure.

Table 4.1.
The Ways of Knowing (WoK) Pilot Instrument (22 Items)

Item code	Stem
	Experiential knowing
EXP-1	I prefer to learn through experience.
EXP-2	In my educational field, I value learning practical application.
EXP-3	I understand best by doing.
EXP-4	When I meet someone for the first time, I can sense how well we will get along.
EXP-5	I learn best by using my hands.
EXP-6	When learning a new task in my job, I prefer to physically engage in how to do it.
EXP-7	Without practical experience, book knowledge is insufficient.
EXP-8	When starting a task, I prefer to jump in right away.
EXP-9	When I see something for the first time, I want to know its practical application.
EXP-10	I value the use of experience in solving problems.
EXP-11	When learning a task at home, I prefer to learn by doing.
	Intellectual knowing
INT-1	When I am confronted with a problem, I tend to think about why the problem exists.
INT-2	It is important for me to be as objective as possible when learning something for the first time.
INT-3	I prefer to meet people that think logically.
INT-4	At work, it is important that I know why we do what we do.
INT-5	I evaluate an argument based upon facts.
INT-6	In the classroom it is important that I know why we do what we are learning.
INT-7	In my educational field, I value the theories of the field.
INT-8	When learning a new task in my job, I prefer to read how to do it.
INT-9	I understand best through reading.
INT-10	I value the use of logic in solving problems.
INT-11	I prefer to gain knowledge through reading.

Note. The item identification codes given here are used to refer to specific items in the subsequent results and discussion. All items are scored with a five-point Likert scale.

Data Screening

The sampling frame consisted of 13,796 undergraduate and graduate students enrolled at a Midwest public research university during the fall term of 2018. The initial sample size was n = 925 (6.70%) of which 708 (5.13%) were complete and useable response sets (i.e., responses were given on all 22 construct measurement items). Of these, three respondents were removed due to nonsensical or flippant responses to open-ended demographic questions indicating that they did not take the questionnaire seriously. Additionally, 19 records were withheld from analysis due to invariant response sets on one or both subscales (e.g., responses were 5s on all items). The n = 686 remaining records were checked for inordinately short completion times. Nothing unusual found as the minimum observed completion time was 93 seconds, which is not an unreasonable completion time given the length of the instrument. Thus, the final usable sample consisted of n = 686 records (4.97%).

Descriptive Statistics

Item Response Data

Basic descriptive statistics for the item response data are given in Table 4.2. The skewness and kurtosis of each item show no excessive departure from normality. All items have a maximum observed value of 5, and nearly all items have a minimum observed value of 1. The two exceptions are EXP-10 and INT-7, which both have minimum values of 2. Also note that INT-8 and INT-9 have relatively low means (less than the midpoint score of 3), but they were not designed to be reverse coded.

Table 4.2.
Descriptive Statistics for Each WoK Item

Item	*M*	*SD*	Skewness	Kurtosis	Response frequency[a]				
					SD	D	N	A	SA
EXP-1	4.37	0.74	-1.24	4.97	3	12	53	275	343
EXP-2	4.44	0.66	-1.26	5.65	2	8	29	292	355
EXP-3	4.32	0.77	-0.98	3.61	1	15	77	263	330
EXP-4	3.73	0.88	-0.52	3.00	6	59	168	332	121
EXP-5	3.82	0.93	-0.57	2.89	7	56	155	301	167
EXP-6	4.20	0.80	-0.90	3.73	2	23	82	310	269
EXP-7	3.52	1.05	-0.34	2.30	16	119	168	259	124
EXP-8	3.19	1.00	0.07	2.06	11	195	197	222	61
EXP-9	3.72	0.80	-0.63	3.48	5	49	166	379	87
EXP-10	4.24	0.61	-0.46	3.73	0	7	44	410	225
EXP-11	4.19	0.75	-0.77	3.74	2	13	86	335	250
INT-1	3.91	0.84	-1.02	4.19	6	56	70	413	141
INT-2	3.85	0.84	-0.68	3.45	5	46	134	365	136
INT-3	3.89	0.82	-0.44	3.04	4	24	175	321	162
INT-4	4.34	0.70	-1.10	4.92	2	12	43	320	309
INT-5	4.10	0.71	-0.69	3.91	1	18	82	392	193
INT-6	4.19	0.80	-1.07	4.33	3	30	60	331	262
INT-7	4.05	0.71	-0.48	3.23	0	17	108	387	174
INT-8	2.90	1.03	0.16	2.28	45	226	207	167	41
INT-9	2.71	1.00	0.24	2.47	66	245	220	130	25
INT-10	4.35	0.67	-0.99	4.62	1	11	38	330	306
INT-11	3.22	1.14	-0.35	2.21	59	138	157	259	73

Note. All statistics based on n = 686 observations

[a]SD = strongly disagree; D = disagree; N = neither agree or disagree; A = agree; SA = strongly agree. Responses were scored as follows: SD = 1, D = 2, N = 3, A = 4, and SA = 5.

Construct Validity

An appraisal of the construct validity of the WoK was conducted using exploratory factor analysis (EFA). More specifically, this analysis was based upon the common-factor model using the principal-factor extraction method (see Gorsuch, 1983, for a detailed reference on this methodology).

Sample Size Considerations

In general, EFA requires a fairly large sample size to reduce the possibility of sample bias (Costello & Osborn, 2005). With larger samples provide more confidence in generalizability and stability (replicability) of results. Sample size also impacts the cutoff values for judging the salience of factor loadings; that is, smaller factor loadings can be consider salient (substantively meaningful) with larger the samples (Yong & Pearce, 2013).

There are a number of varying recommendations and guidelines regarding sample size for EFA. Two primary schools of thought have emerged consistently within the literature: the minimum absolute sample size and the ratio of sample size to observable variables. Many of these guidelines have been thoroughly discussed by Arrindell and van der Ende (1985), Velicer and Fava (1998), and MacCallum, Widaman, Zhang, and Hong (1999). There are varying recommendations regarding absolute sample size. For example, Gorsuch (1983) and Kline (1979) recommended no fewer than 100 subjects, while Comrey and Lee (1992) urge researchers to strive for 500. Guidelines also vary for the ratio of subjects to observed variables. An often-cited minimum ratio suggest no less than five subjects per item (Gorsuch, 1983), yet Nunnally (1978) suggested that 10:1 is ideal. Other sources provide joint recommendations on both criteria, such as an absolute sample size between 100 and 300 along with a ratio of 5 to 10 observations per item (DeVellis, 2012; Yong & Pearce, 2013). Regardless of the inconsistent

guidelines within the methodological literature, this study clearly meets or exceeds all sample-size recommendations with a final sample size of n = 686 and 22 observed variables which gives a ratio of over 30 cases per item.

Number of Factors to Extract

The first major step in EFA involves the determination of the appropriate number of factors to extract (dimensionality). There are a number of methods for determining the number of factors to extract, such as the Kaiser rule (Kaiser, 1960), scree test (Cattell, 1966), parallel analysis (Horn, 1965), minimum average partial correlation (MAP) test (Velicer, 1976), and the sequential Kaiser-Meyer-Olkin (SKMO) procedure (Hill, 2011). Each are briefly described below along with their results for the dataset from this study.

Kaiser (K1) rule. For this dataset, the Kaiser (K1) rule—that is, retaining factors with eigenvalues above 1.0—indicates retaining six factors. However, the Kaiser rule is widely known to greatly overestimate the true number of factors (Hill, 2011).

Scree test. The scree test (Cattell, 1966) involves graphing the eigenvalues from highest to lowest in descending order (which is also their natural order of extraction). This is a visual and somewhat subjective test where the researcher looks for a definitive bend or "elbow" where it shows a flattening of the curve. (Costello & Osborne, 2005; Tabanchnick & Fidel, 2001). For this study, the scree test indicates a three-factor solution (Figure 4.1).

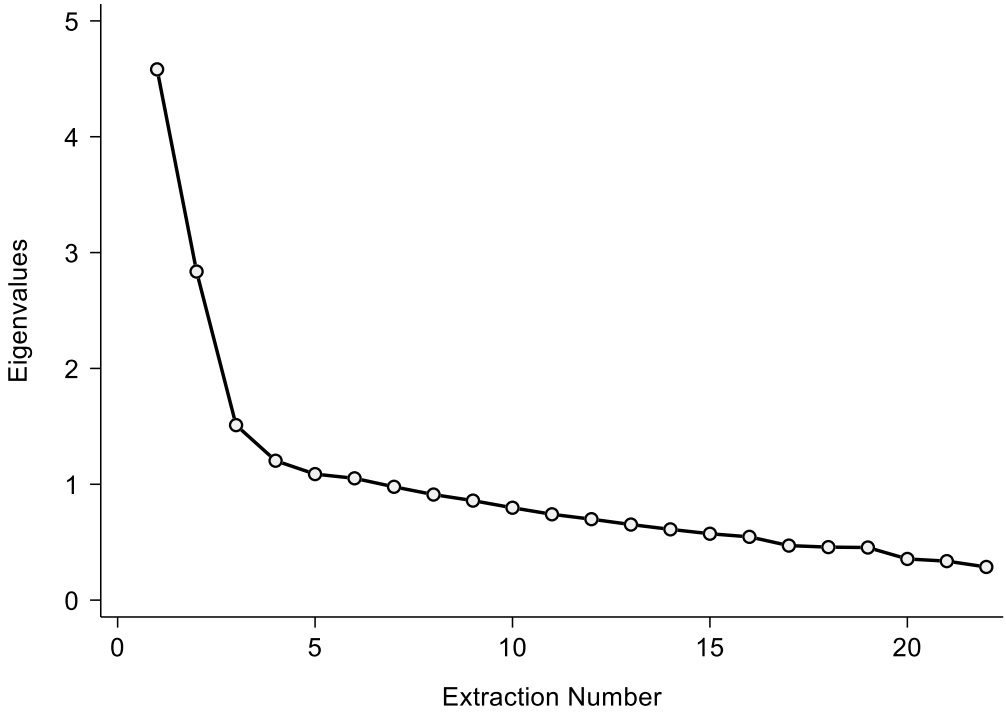


Figure 4.1. Scree test
Scree plot based on the 22 eigenvalues extracted from the preliminary observed correlation matrix. Clearly, there are two strong factors, but the "elbow" at the fourth eigenvalue indicates a third factor.

Parallel analysis. Horn (1965) proposed parallel analysis as an improvement on the Kaiser (K1) rule. This process generates numerous parallel datasets—i.e., random datasets that have the same number of cases and variables as the original observed dataset. Each of these parallel datasets are subjected to eigenanalysis, and the mean eigenvalues are recorded. Those eigenvalues from the real dataset that exceed the average parallel eigenvalues indicate the factors to be retained (Çokluk & Koçak, 2016; Tabanchnick & Fidel, 2001). The main drawback to this method is that the mean eigenvalues are determined from randomly generated datasets, which will naturally vary from one application of the procedure to the next; so, one application of parallel analysis to a real dataset is not guaranteed to produce the same results as another separate application of this method on the same real dataset. This is, in fact, why the parallel

analysis conducted on the dataset from this study produced varying results. For this study, parallel analysis indicated either three or four factors be retained.

Minimum average partial correlation (MAP) test. The minimum average partial correlation (MAP) test is a popular dimensionality test originally proposed by Velicer (1976). This test calculates the mean of the squared partial correlations after each factor is sequentially partialled out. The occurrence of the minimum mean squared partial correlation indicates the number of factors, after which no further factor is extracted. The MAP test indicated the presence of three factors in this dataset.

Sequential Kaiser-Meyer-Olkin (SKMO) procedure. The SKMO test (Hill, 2011) extracts factors one at a time from the reduced correlation matrix then computes the KMO measure of sampling adequacy after each iteration. Extraction stops when the KMO for a given round fails to meet the baseline criteria for factorability (either .50 or .60). For this study, the .50 and .60 cutoffs indicate four and three factors, respectively.

Decision on the number of factors to extract. While there was no consensus among the results of the different dimensionality test, the methodological literature often points to the use of Horn's parallel analysis, Velicer's MAP test, and the scree test as standard practice to determine the proper number of factors to extract (Gorsuch, 1983; Tabachnick & Fidell, 2001). Table 4.3 provides a summary of the results for the dimensionality tests from this dataset. Although there were two hypothesized factors, the dimensionality tests all indicated at least three factors. The

degree of semblance to simple structure and the interpretability of the factor solution were the ultimate arbiters, which clearly suggested a three-factor solution.

Table 4.3.
Results from Various Dimensionality Tests

Test	Number of factors indicated
Kaiser rule	6
Scree test	3
Parallel analysis	3 or 4
MAP test	3
Sequential KMO (.50)	4
Sequential KMO (.60)	3

Preliminary Factor Extractions

Preliminary eigenanalysis was conducted on the correlation matrix based on n = 686 observations for all 22 items, and three factors were subsequently extracted. Complete details of the extraction are provided in Table 4.4. The observed zero-order correlation matrix is provided in Appendix F. Other candidate solutions, namely the two and four factor models, were examined but were found to be deficient or lacking simple structure.

Table 4.4.
Variances Extracted from the Preliminary Correlation Matrix (22 Items)

Factor	Initial[a]			Extraction[b]			Rotated[c]	
	Eigenvalue	Proportion	Cumulative	Eigenvalue	Proportion	Cumulative	SSL	Proportion
1	4.58148	.2082	.2082	4.03895	.1836	.1836	3.82394	.5677
2	2.83638	.1289	.3372	2.11202	.0960	.2796	2.54418	.3777
3	1.51066	.0687	.4058	0.90044	.0409	.3205	2.06150	.3060
4	1.20326	.0547	.4605					
5	1.08790	.0495	.5100					
6	1.05157	.0478	.5578					
7	0.97807	.0445	.6022					
8	0.91124	.0414	.6437					
9	0.85902	.0390	.6827					
10	0.79749	.0362	.7190					
11	0.74078	.0337	.7526					
12	0.69882	.0318	.7844					
13	0.65250	.0297	.8141					
14	0.61096	.0278	.8418					
15	0.57295	.0260	.8679					
16	0.54622	.0248	.8927					
17	0.47062	.0214	.9141					
18	0.45753	.0208	.9349					
19	0.45408	.0206	.9555					
20	0.35543	.0162	.9717					
21	0.33674	.0153	.9870					
22	0.28628	.0130	1.0000					

[a]Eigenvalues extracted from the unreduced correlation matrix (i.e., ones on the main diagonal rather than communality estimates). Proportions based upon total observed variance.

[b]Three factors were extracted from the reduced correlation matrix.

[c]SSL = sum of squared loadings. Three factors were rotated to an oblique (correlated) solution, hence no cumulative proportions of variance extracted.

Rotated factor solution. The three extracted factors were rotated to an oblique solution (i.e., correlated factors) via the oblimin algorithm. The resulting loading (pattern) matrix shows a close approximation to simple structure (Table 4.5).

In accordance with the general recommendations in the current methodological literature, all loadings greater than or equal to .30 in absolute value were deemed salient (substantively meaningful) for this study. Most items have salient loadings; only items EXP-4, EXP-7, and EXP-8 did not reach salience for any factor. No item showed crossloading (salient loadings on more than one factor).

Comrey and Lee (1992) provide a somewhat more nuanced set of reference values for interpreting the absolute values of factor loadings: .32, poor; .45, fair; .55, good; .63, very good; and .71, excellent. Factor 1 is primarily associated with six items, all of which were designed to measure experiential knowing. Five of those items load in the very good to excellent range; the sixth item would be considered fair. Factor 2 consists of three items (all designed to measure intellectual knowing) with all three having factor loadings near or above the excellent range. Factor 3 is associated with 10 items. Three of these items had fair to good loadings; the remaining seven all loaded in the poor range. Note that factor 3 is associated chiefly with intellectual items, but two experiential items (EXP-9 and EXP-10) also loaded on factor 3.

Nearly all items with salient loadings on the first two factors showed very good communalities (the proportion of variance in an observed variable accounted for by all the extracted factors); however, the communalities for the items associated with the third factor were relatively small. For reference, communalities are generally considered high at .7 and above and low at .4 and below (Costello & Osborne, 2005; Fabrigar et al., 1999; Gorsuch, 1983; Stevens, 2002).

Table 4.5.
Preliminary Rotated Factor Loading (Pattern) Matrix and Communalities

Item	Factor			Communality
	1	2	3	
EXP-5	**0.7643**	-0.0076	-0.0767	0.5757
EXP-3	**0.7628**	-0.0583	-0.0534	0.6160
EXP-6	**0.7471**	-0.0328	-0.0079	0.5798
EXP-1	**0.6816**	-0.0505	0.0460	0.5109
EXP-11	**0.6778**	0.0192	0.0252	0.4544
EXP-2	**0.5226**	-0.0057	0.1998	0.3511
EXP-4	0.2834	0.0992	-0.0117	0.0630
EXP-8	0.2115	-0.1013	0.1357	0.0993
INT-9	-0.0458	**0.7893**	-0.0292	0.6536
INT-11	-0.0163	**0.7328**	0.0061	0.5494
INT-8	-0.0154	**0.6880**	0.0092	0.4850
INT-10	-0.1472	-0.0921	**0.5615**	0.2913
INT-3	-0.0784	-0.0382	**0.4853**	0.2225
INT-5	0.0006	-0.0153	**0.4598**	0.2099
INT-1	-0.0486	-0.0230	**0.3980**	0.1513
EXP-10	0.2020	-0.0195	**0.3915**	0.2230
INT-2	-0.1026	-0.0272	**0.3851**	0.1408
EXP-9	0.2868	0.1111	**0.3846**	0.2619
INT-6	0.1922	0.1992	**0.3576**	0.2113
INT-4	0.1524	0.1830	**0.3500**	0.1884
INT-7	0.0360	0.1652	**0.3438**	0.1604
EXP-7	0.1429	-0.0344	0.1430	0.0522

Note. Items have been sorted according to the magnitudes of their strongest loadings. To help illustrate the simple structure in this loading matrix, all salient factor loadings (i.e., loadings with an absolute value greater than .30) are in boldface and underscored.

Item elimination. An inspection of the rotated loading matrix (Table 4.5) revealed that three items needed to be removed from the instrument. Hence, items EXP-4, EXP-7, and EXP-8 were removed as they did not exhibit a salient loading on any factor.

Final Factor Extraction

Since items were removed in the preliminary factor extraction and rotation, a revised factor solution needed to be computed for this set of 19 observed variables. The final eigenanalysis was conducted on the correlation matrix based on n = 686 observations for the remaining 19 items, and three factors were subsequently extracted. Complete details of the extraction are provided in Table 4.6.

Table 4.6.
Variances Extracted from the Final Correlation Matrix (19 Items)

Factor	Initial[a]			Extraction[b]			Rotated[c]	
	Eigenvalue	Proportion	Cumulative	Eigenvalue	Proportion	Cumulative	SSL	Proportion
1	4.39455	.2313	.2313	3.86686	.2035	.2035	3.66208	.5851
2	2.82016	.1484	.3797	2.08342	.1097	.3132	2.49806	.3991
3	1.48245	.0780	.4577	0.87234	.0459	.3591	1.99442	.3186
4	1.16074	.0611	.5188					
5	0.98316	.0517	.5706					
6	0.91916	.0484	.6190					
7	0.87856	.0462	.6652					
8	0.77133	.0406	.7058					
9	0.72772	.0383	.7441					
10	0.66503	.0350	.7791					
11	0.62781	.0330	.8121					
12	0.60699	.0319	.8441					
13	0.55289	.0291	.8732					
14	0.48564	.0256	.8987					
15	0.47115	.0248	.9235					
16	0.46087	.0243	.9478					
17	0.35743	.0188	.9666					
18	0.34239	.0180	.9846					
19	0.29197	.0154	1.0000					

[a]Eigenvalues extracted from the unreduced correlation matrix (i.e., ones on the main diagonal rather than communality estimates). Proportions based upon total observed variance.

[b]Three factors were extracted from the reduced correlation matrix.

[c]SSL = sum of squared loadings. Three factors were rotated to an oblique (correlated) solution, hence no cumulative proportions of variance extracted.

Rotated factor solution. Again, three factors were extracted and rotated to an oblique solution (i.e., correlated factors) via the oblimin algorithm. The resulting loading (pattern) matrix shows a close approximation to simple structure (Table 4.7). The results from this final

factor extraction and rotation are virtually no different from those produced by the preliminary extraction and rotation.

Table 4.7.
Final Rotated Factor Loading (Pattern) Matrix and Communalities

Item	Factor			Communality
	1	2	3	
EXP-5	**0.7653**	-0.0074	-0.0754	0.5776
EXP-3	**0.7588**	-0.0598	-0.0546	0.6114
EXP-6	**0.7562**	-0.0254	-0.0104	0.5877
EXP-1	**0.6824**	-0.0523	0.0499	0.5144
EXP-11	**0.6778**	0.0198	0.0237	0.4535
EXP-2	**0.5234**	-0.0054	0.1965	0.3491
INT-9	-0.0412	**0.7965**	-0.0365	0.6603
INT-11	-0.0213	**0.7206**	0.0150	0.5369
INT-8	-0.0173	**0.6833**	0.0071	0.4794
INT-10	-0.1353	-0.0924	**0.5662**	0.2962
INT-3	-0.0756	-0.0354	**0.4813**	0.2194
INT-5	0.0030	-0.0161	**0.4601**	0.2104
INT-1	-0.0642	-0.0362	**0.3990**	0.1501
EXP-10	0.2083	-0.0197	**0.3933**	0.2274
INT-2	-0.0923	-0.0242	**0.3848**	0.1407
EXP-9	0.2878	0.1195	**0.3683**	0.2482
INT-7	0.0383	0.1605	**0.3509**	0.1645
INT-6	0.1962	0.2047	**0.3500**	0.2082
INT-4	0.1584	0.1864	**0.3448**	0.1871

Note. Items have been sorted according to the magnitudes of their strongest loadings. To help illustrate the simple structure in this loading matrix, all salient factor loadings (i.e., loadings with an absolute value greater than .30) are in boldface and underscored.

As this is an oblique factor solution, factors are allowed to correlate, and the correlations among the three factors are shown in Table 4.8. Good discriminant validity between factors 1 and 2 was achieved. Factor 3 is essentially unrelated to the other two factors.

Table 4.8.
Inter-factor Correlations

Factor	1	2
2	-.4618	
3	.1662	.1365

Reliability

This section presents the results from the reliability analyses of the three subscales corresponding to the three factors that emerged from the EFA. Specifically, these are evaluations of internal consistency using Cronbach's alpha.

Subscale 1

The first factor was defined by six items (EXP-1, EXP-2, EXP-3, EXP-5, EXP-6, and EXP-11) and ostensibly corresponds to the experiential knowing construct. Subsequently, these items constitute the first subscale of the WoK instrument which has a very good reliability of $\alpha = .8616$. The item-level details of the reliability analysis are given in Table 4.9. Although the reliability of this subscale could be improved slightly by eliminating item EXP-2, it was not removed.

Table 4.9.
Details of the Reliability Analysis for Subscale 1

Item	Item-subscale correlation	Item-rest correlation	Alpha if item omitted
EXP-1	.7781	.6733	.8355
EXP-2	.6314	.4995	.8634
EXP-3	.8222	.7298	.8249
EXP-5	.8221	.7037	.8312
EXP-6	.8131	.7125	.8277
EXP-11	.7398	.6202	.8446

Note. Subscale 1 reliability: α = .8616.

Subscale 2

The second factor appears to represent the intellectual knowing construct. This factor was defined by three items (INT-8, INT-9, and INT-11) which produced a good subscale reliability of α = .8157. The details of the reliability analysis are shown in Table 4.10. Clearly, the reliability of this subscale would be diminished if any items were removed.

Table 4.10.
Details of the Reliability Analysis for Subscale 2

Item	Item-subscale correlation	Item-rest correlation	Alpha if item omitted
INT-8	.8264	.6211	.7924
INT-9	.8815	.7364	.6816
INT-11	.8611	.6551	.7652

Note. Subscale 2 reliability: α = .8157.

Subscale 3

A third factor emerged from the EFA corresponding to 10 items (INT-1, INT-2, INT-3, INT-4, INT-5, INT-6, INT-7, INT-10, EXP-9, and EXP-10). This subscale shows only a modest

reliability with α = .6845. Reliability analysis details are given in Table 4.11. Removal of any items in this subscale would not improve its reliability.

Table 4.11.
Details of the Reliability Analysis for Subscale 3

Item	Item-subscale correlation	Item-rest correlation	Alpha if item omitted
INT-1	.5062	.3170	.6672
INT-2	.4808	.2874	.6732
INT-3	.5325	.3533	.6596
INT-4	.5019	.3471	.6608
INT-5	.5304	.3773	.6554
INT-6	.5280	.3520	.6597
INT-7	.4807	.3196	.6655
INT-10	.5574	.4187	.6492
EXP-9	.5307	.3560	.6589
EXP-10	.4773	.3410	.6630

Note. Subscale 3 reliability: α = .6845.

Summary

This chapter focused on the finding of the common factor solution. Further, issues related to sample size and questionnaire responses were addressed in this chapter. By utilizing various statistical measures, it was determined that participants in the study are representative of the larger population.

An unanticipated result was the appearance of a third factor. The third factor consisted mostly of items intended to measure the intellectual knowing construct, but there were two items designed to tap experiential knowing. The appearance of the third factor and the mixed nature of the items that loaded upon it suggest that further exploration of this emergent factor is needed.

In considering the emergence of a third factor, separate EFAs were considered under different demographic categories and the results were virtually the same.

Several validity measures appropriate for EFA were discussed in this chapter. The study results suggest a simple, interpretable structure. Though theory suggested two factors a third factor did emerge, suggesting future research refinement and research is needed to explore the nature of the third factor.

CHAPTER V: DISCUSSION

This research study was designed to examine the theoretical framework of intellectual and experiential knowing. The variables within this study have not been examine beyond that of the given framework. Indeed, the uniqueness of this research is that this is the first study to explore the structures of this particular theoretical framework.

Brief Summary of Results

Although there were two hypothesized constructs, three factors emerged as the best fit for the observed data. Factor 1 represents experiential knowing (EK), and factor 2 represents intellectual knowing (IK). Factor 3 (yet to be identified or labeled) potentially represents an unknown construct.

Discussion

Experiential Knowing

The original EK subscale consisted of 11 items; five of those items did not perform as intended. Three items (EXP-4, EXP-7, and EXP-8) did not achieve salience (a loading of .30 or higher in absolute value) for any factor. Two items (EXP-9 and EXP-10) achieved salient loadings, but not on their intended factor; specifically, these two items loaded on factor 3. Hence, these five items need to be examined and discussed. Table 5.1 shows the five problematic items.

When reading the items that did not load on any factor there appears to be a lack of clarity. For example, item EXP-4 states, “When I meet someone for the first time, I can sense how well we will get along.” While the intention of this item was to explore experiential knowing, one might interpret the ideas of “sensing” and “getting along” with emotional experience. Similarly, EXP-7 suggests a relational component to the experimental knowing that

exists with practical experience and the intellectual nature of "book knowledge." This item would likely be better suited if it did not tap into both concepts. Item EXP-8 ("When starting a task, I prefer to jump in right away.") is neither EK or IK in nature but rather overly subjective in that it is entirely up to the individual as to how one would define the nature of "jumping in"; in other words, the sentence is poorly written and should be reworded. Thus, upon further scrutiny, these items are not in alignment with the theoretical definition of experiential knowing. Further, these items appear to lack the ability to tap into the experiential factor due to the lack of clarity that exists within the structure of the sentences.

For the other two errant loaded factors, the wording continued to play a role in the unintended loading that was seen. EXP-9 uses the wording "know," which in Western culture represents a very intellectual cognitive process one that was discussed in great details in earlier chapters. The recommendation for this item would be to revise by removing the word "know" from the sentence to see if this is what caused the errant loading. For item EXP-10 the wording of solving problems might have caused the errant loading as it might have suggested a more intellectual process than experiential, thus it is recommended that it be reworded (for example, "I value the use of experience in every day application").

Table 5.1.
Problematic Items

Item	Stem
EXP-4[a]	When I meet someone for the first time, I can sense how well we will get along.
EXP-7[a]	Without practical experience, book knowledge is insufficient.
EXP-8[a]	When starting a task, I prefer to jump in right away.
EXP-9[b]	When I see something for the first time, I want to know its practical application.
EXP-10[b]	I value the use of experience in solving problems.

[a]Item did not achieve salient loading.

[b]Item loaded on a factor other than the intended factor.

Intellectual Knowing

The Intellectual factor, IK, was represented by three items of the original 11-item subscale. The other eight items loaded to an unknown factor (factor 3). The three items when reviewed highlight and interesting process in the intellectual subscale. Each item that loaded to the IK factor contain the word "reading" within the statement. The intellectual process of internalizing knowledge through acquisition or gaining is strongly represented within these items. Since the number of items comprising this subscale is near the lower limit recommended in the literature, the development of additional IK items should be a primary goal of future research.

Table 5.2.
Items in the IK Subscale

Item	Stem
INT-8	When learning a new task in my job, I prefer to read how to do it
INT-9	I understand best through reading
INT-11	I prefer to gain knowledge through reading

Factor 3

The appearance of a third factor is a surprising, as it is represented mostly by items designed to tap IK. These results indicate a need for the IK items to be further explored. There are a few potential reasons for a third factor to emerge, the first and most obvious explanation being that the factor does indeed exist. The second possible reason would suggest the presence of a method effect—i.e., some trivial property of a set of items that unintentionally elicits a systematic effect (e.g., items written in past tense).

Since theory suggested two factors, let us first consider reviewing the items for factor 3. Table 5.3 highlights an initial review of wording. There are a few common themes that stand out. First, the wording of items INT-10, INT-1, and EXP-10 all reference problems or problem solving. Secondly, the items INT-4, INT-6, and EXP-9 contain the phrase “I know” (or a variation thereof). In the first items, problem solving might represent an already latent cognitive process or contextual experience, in other words it might more closely be representative of an item that is a mixture of both IK and EK depending on the individual answering the question. Further, the historical context and language surrounding problem solving might disproportionately already represent the intellectual construct of intelligence. Similarly, the

second set of items state “I know” which again given the formation of the items suggests a way in which individuals acquire and utilize knowledge.

Intelligence has been well studied and defined (for a rather thorough review of the state of intelligence see Neisser et al., 1996). There is no single consensus towards a definition for intelligence. However, here are just a few definitions, intelligence is “the capacity to solve problems or to fashion products that are valued in one or more cultural setting” (Gardner & Hatch, 1989, p. 4), or “the resultant of the processes of acquiring, storing in memory, retrieving, combining, comparing, and using in new contexts information and conceptual skills; it is an abstraction” (Humphreys, 1979, p. 115). Given these definitions in conjunction with the language and structure of the written items in Table 5.1, it might be considered that the items associated with factor 3 are in fact representing an intellectual construct that aligns with intelligence or even more abstract such as self-efficacy of personal knowledge.

Alternatively, the formation of mostly IK items within a third factor may suggest two subtypes of intellectual knowing. IK as previously discussed is orientated around the process of gaining knowledge where factor 3 is orientated around the use of knowledge. This highlights an interesting alternative that needs to be further explored. The very nature of experiential knowing suggest that learning and using are done together where in the cognitive framework particularly shown in the emergence of a third factor, might suggest that gaining knowledge and using that knowledge are done separately.

Table 5.3.
Items Loading on Factor 3

Item	Stem
EXP-9	When I see something for the first time, ***I*** want to ***know*** its practical application.
EXP-10	I value the use of experience in solving ***problems***.
INT-1	When I am confronted with a ***problem***, I tend to think about why the ***problem*** exists.
INT-2	It is important for me to be as objective as possible when learning something for the first time.
INT-3	I prefer to meet people that think logically.
INT-4	At work, it is important that ***I know*** why we do what we do.
INT-5	I evaluate an argument based upon facts.
INT-6	In the classroom it is important that ***I know*** why we do what we are learning.
INT-7	In my educational field, I value the theories of the field.
INT-10	I value the use of logic in solving ***problems***.

Recommendations for Future Research

It is clear that experiential or embodied knowing is an emerging area of research that needs further exploration and clarification. Since this is the first iteration of this study, there are a number of strategies to consider for future research. This section will briefly discuss strategies to consider for future research.

Since theory suggest two factors, future research might consider focusing on exploring the EK and IK scales. Cutting any of the items that did not load on the EK and IK scale and focusing on developing a few more items for the IK scale. Since a number of the intellectual items loaded on an unknown factor (factor 3), researchers might consider reworking those items to align with the IK scale.

Given that a third factor did emerge, researchers might consider exploring the third factor in greater detail. Does a third factor indeed exist? If a third factor does indeed exist, what is the nature of that factor? Future research might consider exploring whether factor 3 and IK represent sub-categories of intellectual knowing. Further, with item stems referencing learn or learning there are potentially similarities to learning styles, such things need to be explored theoretically and comparatively.

Finally, future research should focus on adding to the emerging literature regarding embodied knowing. Certainly, future research might consider exploring the context of use of embodied knowing, exploring different contextual basis, such as in work, at home, in school, etc. While all these were part of a scale it might be explored in one context and compared to another context to determine if context is a significant contributor within the scale. Other relevant traits such as intellectual maturity, gender, and country of origin might also be considered to determine if they are contributors within the WoK scale.

Conclusion

This study is the first integration of an emerging theoretical framework of human knowing. Theory still plays a significant role in our understanding of human knowing, however it is critical that as researchers we understand the context of the nature of knowing.

Ancient Greek philosophy has been the bedrock of the Western knowledge system(s). One might argue that Western culture is entrenched within ancient Greek philosophy as it has been a part of society since the beginning of our civilization. This study pushes the bounds of knowing, to explore an emerging construct of experiential as embodied and the relationship to the long-standing construct of intellectual knowing.

The three components that emerged from the rotation highlighted a clear, interpretable structure. The variable loadings were strong. These results suggest that further analysis is warranted.

REFERENCES

Adams, D., & Belasco, J. (1999). Tapestry Institute. Retrieved September 14, 2015

Allen, W. (1992). The color of success: African-American college student outcomes at predominately White and historically Black public colleges and universities, *Harvard Educational Review, 62*(1), 26-44

Allen, W., Epps, E., & Haniff, N. (Eds.), (1991). *College in Black and White: African American students in predominately White and historically Black public* u*niversities.* Albany, NY: State University of New York Press.

Aronowitz, S. (2004). Against Schooling: Education and Social Class. *Social Text, 22*(2), 13-35. doi:10.1215/01642472-22-2_79-13

Barnhardt, R., & Kawagley, A. O. (2005). Indigenous Knowledge Systems and Alaska Native Ways of Knowing. *Anthropology and Education Quarterly, 36*(1), 8-23. doi:10.1525/aeq.2005.36.1.008

Bennet, C. (1995). *Research on racial issues in American higher education*. In Banks, J. A. & Banks C. A. (2004). *Handbook of research on multicultural education.* San Fransico, CA: Jossey-Bass.

Boyer, E. (1990). *Scholarship reconsidered: Priorities of the professoriate*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Cajete, G. (2003). *Look to the mountain: An ecology of Indigenous education.* Durango, CO: Kivakí Press.

Carey, K. (2005). *One step from the finish line: higher college graduation rates are within our reach*. Washington, DC: Education Trust.

Cattell, R. B. (1978). *The Scientific Use of Factor Analysis.* New York: Plenum.

Clark, A. (2008). *Supersizing the mind: Embodiment, action, and cognitive extension***.** Oxford: Oxford University Press.

Cohen, A., & Kisker, C. (2010). *The shaping of American higher education: Emergence and growth of the contemporary system* (2nd ed.). San Francisco, CA: Jossey-Bass.

Çokluk, Ö, & Koçak, D. (2016). Using Horn's Parallel Analysis Method in Exploratory Factor Analysis for Determining the Number of Factors. *Educational Sciences: Theory & Practice, 16*(2), 537-551. doi:10.12738/estp.2016.2.0328

Comrey, A. L., & Lee, H. B. (1992*). A first Course in Factor Analysis*. Hillsdale, NJ: Erlbaum.

Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10* (7), 1-9.

Deloria, V. (1979). *The metaphysics of modern existence*. San Francisco: Harper & Row.

Descartes, R., Haldane, E. S., & Ross, G. R. (1931). *The philosophical works of Descartes*. Cambridge: The University Press.

Dewey, J. (1904). *The relation of theory to practice in the education of teachers.* Chicago: University of Chicago.

Dods, R. R. (2004). Knowing ways/ways of knowing: Reconciling science and tradition. *World Archaeology, 36*(4), 547-557. doi:10.1080/0043824042000303719

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.

Feagin, J. R. (1992). The continuing significance of racism: Discrimination against Black students in White colleges. *Journal of Black Studies, 22*(4), 546-578. doi:10.1177/002193479202200407

Feagin, J. R., Vera, H., & Imani, N, (1996), *The agony of education: Black students at White colleges and universities.* New York: Routledge

Fiske, E. B. (1988). The Undergraduate Hispanic Experience: A Case of Juggling two Cultures. *Change: The Magazine of Higher Learning,20*(3), 29-33. doi:10.1080/00091383.1988.9939813

Fleming, J. (1984). *Blacks in college*, Jossey-Bass, San Francisco, CA.

Freiler, T. (2008). Learning Through the Body. New *Directions for Adult and Continuing Education*, (119), 37-47. doi:10.1002/ace.304

Gandara, P. (1999). Staying in the race: The challenge for Chicanos/as in higher education. In: Moreno, J. (ed.), The elusive quest for equality: 150 years of Chicano Chicana education, Harvard Educational Review, Cambridge, MA, pp. 169–196.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York, NY: Basic Books.

Gardner, H., & Hatch, T. (1989). Multiple Intelligences Go to School: Educational Implications of the Theory of Multiple Intelligences. *Educational Researcher, 18*(8), 4. doi:10.2307/1176460

Gibbs, R. W. (2006). *Embodiment and cognitive science*. Cambridge: Cambridge University Press

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates

Govier, T. (1997). *Socrates children: thinking and knowing in the Western tradition*. Peterborough, Ont.: Broadview Press

Guillory, R. M. (2009). American Indian/Alaska Native College Student Retention Strategies. *Journal of Developmental Education, 33*(2), 12-38.

Hatfield, Gary, "René Descartes", *The Stanford Encyclopedia of Philosophy* (Summer 2016 Edition), Edward N. Zalta (ed.), forthcoming URL = <http://plato.stanford.edu/archives/sum2016/entries/descartes/>.

Herman, A. (2014). *The cave and the light: Plato versus Aristotle, and the struggle for the soul of Western civilization*. New York: Random House Trade Paperbacks.

Hoffman, S. J. (1985). Specialization Fragmentation = Extermination. *Journal of Physical Humphreys, L. G. (1979). The construct of general intelligence. Intelligence, 3(2), 105-120. doi:10.1016/0160-2896(79)90009-6Education, Recreation & Dance, 56*(6), 19-22. doi:10.1080/07303084.1985.10603786

Johnson, M. (2008). *The meaning of the body: Aesthetics of human understanding*. Chicago, IL: University of Chicago Press.

Kline, P. (1979). *Psychometrics and psychology*. London: Academic Press.

Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and development.* Englewood Cliffs: Prentice-Hall.

Kraut, Richard, "Plato", The Stanford Encyclopedia of Philosophy (Spring 2015 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/spr2015/entries/plato/>.

Labaree, D. F. (2003). The Peculiar Problems of Preparing Educational Researchers. *Educational Researcher, 32*(4), 13-22. doi:10.3102/0013189x032004013

Ladson-Billings, G. J. (1999). Chapter 7: Preparing Teachers for Diverse Student Populations: A Critical Race Theory Perspective. *Review of Research in Education, 24*(1), 211-247. doi:10.3102/0091732x024001211

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh the embodied mind and its challenge to Western thought*. New York, NY: Basic Books.

Larimore, J. A., & McClellan, G. S. (2005). Native American student retention in U.S. postsecondary education. *New Directions for Student Services*(109), 17-32. doi:10.1002/ss.150

Legree, P. J. (1995). Evidence for an oblique social intelligence factor established with a Likert-based testing procedure. *Intelligence, 21*(3), 247-266. doi:10.1016/0160-2896(95)90016-0

Lewicki, P., Hill, T., & Bizot, E. (1988). Acquisition of procedural knowledge about a pattern of stimuli that cannot be articulated. *Cognitive Psychology, 20*(1), 24-37. doi:10.1016/0010-0285(88)90023-0

Magolda, M. (1992). *Knowing and reasoning in college: Gender-related patterns in students' intellectual development*. San Francisco: Jossey-Bass.

Manning, K., & Coleman-Boatwright, P. (1991). Student Affairs Initiatives toward a Multicultural University. *Journal of College Student Development, 32*(4), 367-374.

Merriam, S. B., & Kim, Y. S. (2008). Non-Western perspectives on learning and knowing. *New Directions for Adult and Continuing Education, 2008*(119), 71-81. doi:10.1002/ace.307

Nails, Debra, "Socrates", *The Stanford Encyclopedia of Philosophy* (Spring 2014 Edition), Edward N. Zalta (ed.), https://plato.stanford.edu/archives/spr2014/entries/socrates/.

Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., Halpern, D. F., Loehlin, J. C., Perloff, R., Sternberg, R. J., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist, 51*, 77 - 101.

Nunnally, J. C. (1978). *Psychometric theory* 2nd Ed.). New York: McGraw-Hill

Perry, W. (1970). *Forms of intellectual and ethical development in the college years; a scheme.* New York: Holt, Rinehart and Winston

Pfeifer, R., & Bongard, J. (2007). *How the body shapes the way we think: a new view of intelligence.* Cambridge, MA: MIT Press.

Polanyi, M. (1966). The Logic of Tacit Inference. *Philosophy, 41*(155), 1-18. doi:10.1017/s0031819100066110

Ryle, G. (1949). *The concept of the mind.* Chicago: University of Chicago Press.

Shapiro, L. A. (2011). *Embodied cognition*. London: Routledge/Taylor & Francis Group.

Shields, Christopher, "Aristotle", *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2015/entries/aristotle/>.

Shiva, Vandana (1993) Monocultures of the Mind *Trumpeter:* 10, 4. http://www.icaap.org/iuicode?6.10.4.11

Spring, J. H. (2011). *The American school: a global context from the puritans to the Obama era* (8th ed.). New York: McGraw-Hill

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.).Mahwah, NJ: Lawrence Erlbaum Associates.

Swartz, E. (2009). Diversity: Gatekeeping Knowledge and Maintaining Inequalities. *Review of Educational Research, 79*(2), 1044-1083. doi:10.3102/0034654309332560

Tierney, W. G. (2008). Facts and constructs: Defining reality in higher education organizations. In W. G. Tierney, *The impact of culture on organizational decision making: Theory and practice in higher education* (pp. 9-44). Sterling, VA: Stylus.

Toulmin, S. (2003). *Return to reason*. Cambridge, MA: Harvard University.

Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: cognitive science and human experience*. Cambridge, Massachusetts: MIT Press.

Watson, L., Terrell, M., Wright, D., & Associates. (2002). *How minority students experience college: Implications for planning and policy.* Sterling, VA: Stylus.

APPENDIX A: INITIAL INVITATION EMAIL

Subject: Intellectual and Experiential Ways of Knowing Research

Hello Fellow NDSU Students,

My name is Frank Oakgrove and I am a doctoral student in the School of Education at NDSU. For my dissertation, I am seeking to examine experiential and intellectual ways of knowing. As the future caretakers of our respective fields, I am inviting you to participate in this research study. The survey will only take approximately 10 minutes to complete. You must be an enrolled student to participate in this study.

To access the survey, please click here. If the survey does not open automatically, please copy and paste the following link to your internet browser's address bar

https://ndstate.co1.qualtrics.com/jfe/form/SV_e3YTpWaLFumcF49

If you have any questions or concerns about this study or your participation, please email me at francis.oakgrove@ndsu.edu

This study is being conducted by professor Brent Hill, Ph.D. and graduate student Frank Oakgrove.

IRB Approval #HE18215
Thank you for your time.

Frank Oakgrove, M.Ed.
School of Education Ph.D. Candidate
North Dakota State University

APPENDIX B: REMINDER EMAIL

Subject: Intellectual and Experiential Ways of Knowing

Hello Fellow NDSU Students,

My name is Frank Oakgrove and I am a doctoral student in the School of Education at NDSU.

A week ago, I sent out an email requesting your participation in a research study focusing on experiential and intellectual ways of knowing. If you have already taken the survey, thank you for participating! If you haven't taken the survey, there is still time. The survey will only take approximately 10 minutes to complete. You must be an enrolled student to participate in this study.

To access the survey, please click here. If the survey does not open automatically, please copy and paste the following link to your internet browser's address bar

https://ndstate.co1.qualtrics.com/jfe/form/SV_e3YTpWaLFumcF49

If you have any questions or concerns about this study or your participation, please email me atfrancis.oakgrove@ndsu.edu

This study is being conducted by professor Brent Hill, Ph.D. and graduate student Frank Oakgrove.

IRB Approval #HE18215
Thank you for your time.

Frank Oakgrove, M.Ed.
School of Education Ph.D. Candidate
North Dakota State University

APPENDIX C: FINAL REMINDER EMAIL

Subject: Intellectual and Experiential Ways of Knowing

Hello Fellow NDSU Students,

My name is Frank Oakgrove and I am a doctoral student in the School of Education at NDSU.

A few weeks ago, I sent out an email requesting your participation in a research study focusing on experiential and intellectual ways of knowing. If you have already taken the survey, thank you for participating! If you haven't taken the survey, this serves as the final reminder. The survey will only take approximately 10 minutes to complete. You must be an enrolled student to participate in this study.

To access the survey, please click here. If the survey does not open automatically, please copy and paste the following link to your internet browser's address bar

https://ndstate.co1.qualtrics.com/jfe/form/SV_e3YTpWaLFumcF49

If you have any questions or concerns about this study or your participation, please email me at francis.oakgrove@ndsu.edu

This study is being conducted by professor Brent Hill, Ph.D. and graduate student Frank Oakgrove.

IRB Approval #HE18215
Thank you for your time.

Frank Oakgrove, M.Ed.
School of Education Ph.D. Candidate
North Dakota State University

APPENDIX D: PILOT INSTRUMENT

This appendix contains a basic mockup of the pilot instrument used in this study (excluding the consent portion). The operational version of this instrument was an online form hosted on Qualtrics. Note that the drop-down menu for degree being sought has been condensed.

Ways of Knowing

What is your gender/gender identity?
- Female
- Female-to-male transgender
- Male
- Male-to-female transgender
- Not sure
- Other/unspecified

_____

Please Identify your major (if double major please list both)

_____

Degree being sought

▼ Bachelor of Arts (B.A.) (1) ... Doctor of Philosophy (Ph.D.) (38)

What do you consider to be your home Country or Countries?
** Given the nature of the concepts being studied, the prevailing philosophies of the region(s) in which you were raised may have an impact. **

_____

Are you Hispanic, Latino/a, or of Spanish origin?
Yes
No

How would you describe yourself? Please select all that apply.
American Indian or Alaska Native
Asian
Black or African American
Native Hawaiian or Other Pacific Islander
White
Other
_____

Instructions: Carefully read each item and select the most appropriate response for yourself. There are no right or wrong answers!

1. When I am confronted with a problem, I tend to think about why the problem exists.
2. It is important for me to be as objective as possible when learning something for the first time.
3. I prefer to meet people that think logically.
4. At work, it is important that I know why we do what we do.
5. I evaluate an argument based upon facts.
6. In the classroom it is important that I know why we do what we are learning.
7. In my educational field, I value the theories of the field.
8. When learning a new task in my job, I prefer to read how to do it.
9. I understand best through reading.
10. I value the use of logic in solving problems.
11. I prefer to gain knowledge through reading.
12. I prefer to learn through experience.
13. In my educational field, I value learning practical application.
14. I understand best by doing.
15. When I meet someone for the first time, I can sense how well we will get along.
16. I learn best by using my hands.
17. When learning a new task in my job, I prefer to physically engage in how to do it.
18. Without practical experience, book knowledge is insufficient.
19. When starting a task, I prefer to jump in right away.
20. When I see something for the first time, I want to know its practical application.
21. I value the use of experience in solving problems.

22. When learning a task at home, I prefer to learn by doing.

Response options: Strongly Disagree (1), Disagree (2), Neither Agree nor Disagree (3), Agree (4), and Strongly Agree (5).

APPENDIX E: SME RATINGS

Item	Intended construct	Individual SME response				Parity
		1	2	3	4	
At work it is most important to know how we do what we do.	E	✗	✓	✗	✓	50%
I prefer to learn through experience.	E	✓	✓	✓	✓	100%
In my educational field, I value learning practical application.	E	✓	✓	✓	✓	100%
I understand best by doing.	E	✓	✓	✓	✓	100%
When I am confronted with a problem, I want to know how to solve it.	E	✗		✗	✓	25%
When I meet someone for the first time, I can sense how well we will get along.	E	✓	✓	✓	✓	100%
I learn best by using my hands.	E	✓	✓	✓	✓	100%
When learning a new task in my job, I prefer to physically engage in how to do it.	E	✓		✓	✓	75%
I evaluate an argument by understanding the context of the argument.	E	✗		✗	✓	25%
Without practical experience, book knowledge is insufficient.	E	✓	✓	✓	✓	100%
When starting a task, I prefer to jump in right away.	E	✓	✓	✓	✓	100%
When I see something for the first time, I want to know its practical application.	E	✓	✓		✓	75%
I value the use of experience in solving problems.	E	✓		✓	✓	75%
When learning a task at home, I prefer to learn by doing.	E	✓		✓	✓	75%
When I am confronted with a problem, I prefer to think about the steps to solve the problem.	I	✓	✗	✓	✓	75%
When starting a task, I prefer develop steps to accomplish the task.	I	✓	✗		✓	50%
It is important for me to be as objective as possible when learning something for the first time.	I	✓		✓	✓	75%
I prefer to meet people that think logically.	I	✓		✓	✓	75%
At work, it is important that I know why we do what we do.	I	✓	✓	✓	✓	100%
I evaluate an argument based upon facts.	I	✓	✓	✓	✓	100%
When learning how to home repair, I prefer to read about how to do it.	I	✗		✓	✓	50%
In the classroom it is important that I know why we do what we are learning.	I	✓		✓	✓	75%

In my educational field, I value the theories of the field.	I	✔	✔	✔	✔	100%
When learning a new task in my job, I prefer to read how to do it.	I	✔		✔	✔	75%
When I am confronted with a problem, I tend to think about why the problem exists.	I	✔	✔	✔	✔	100%
I understand best through reading.	I	✔	✔	✔	✔	100%
I value the use of logic and reason in solving problems.	I	✔	✔	✔	✔	100%
I prefer to gain knowledge through reading.	I	✔		✔	✔	75%

Note. E = experiential knowing; I = intellectual knowing.

✔ = SME classified the item in agreement with the intended construct.

✕ = SME classified the item in disagreement with the intended construct.

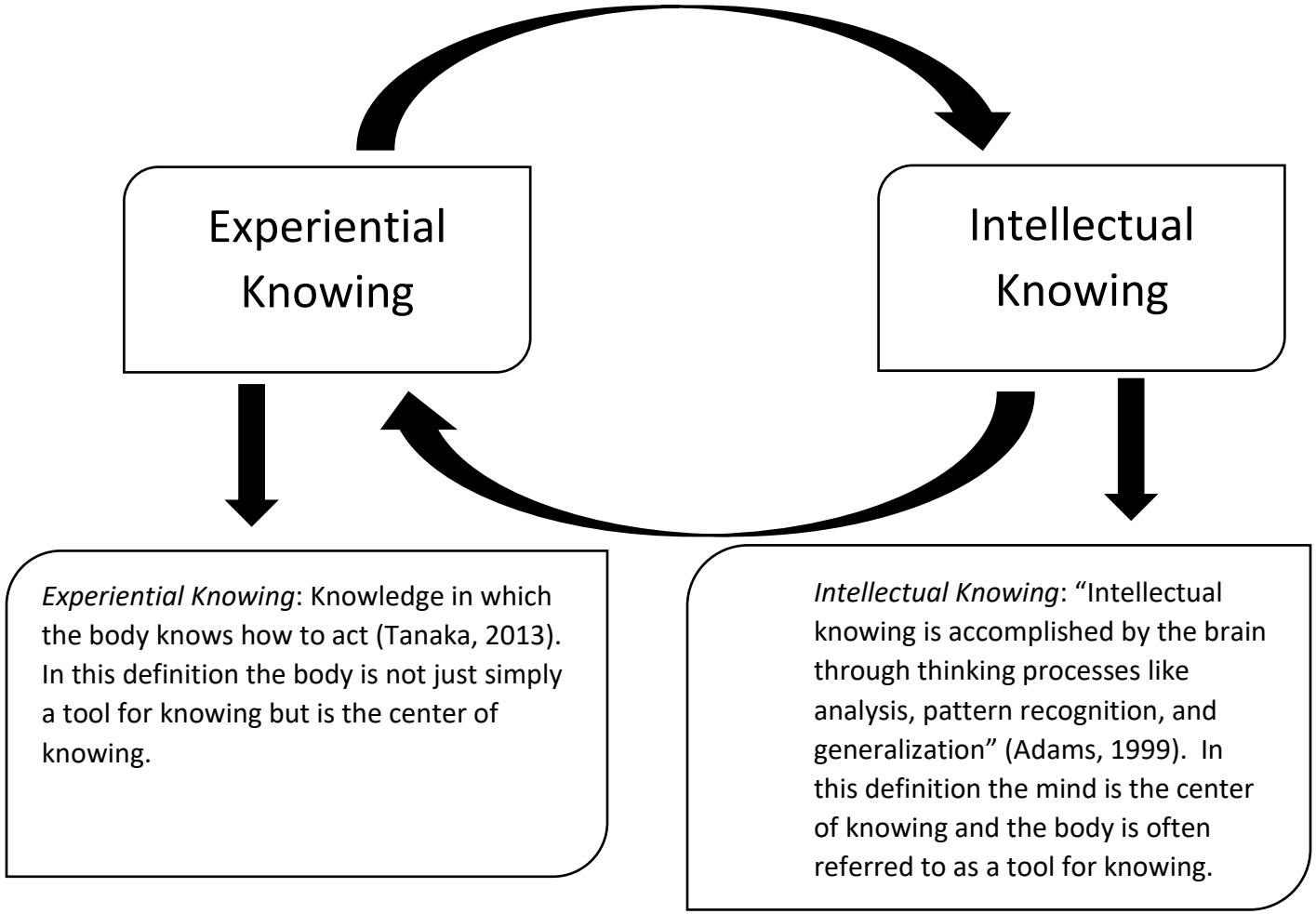
(blank) = SME undecided.

APPENDIX F: OBSERVED CORRELATION MATRIX

This appendix provides the observed zero-order correlation matrix for n = 686 subjects on k = 22 observed variables (items).

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. EXP-1	-																					
2. EXP-2	.436	-																				
3. EXP-3	.625	.421	-																			
4. EXP-4	.165	.138	.193	-																		
5. EXP-5	.525	.393	.614	.177	-																	
6. EXP-6	.536	.430	.597	.131	.633	-																
7. EXP-7	.088	.173	.164	.008	.090	.103	-															
8. EXP-8	.195	.146	.200	.136	.193	.211	.122	-														
9. EXP-9	.155	.281	.167	.080	.191	.242	.161	.200	-													
10. EXP-10	.211	.256	.166	.050	.179	.210	.103	.077	.306	-												
11. EXP-11	.494	.336	.529	.163	.533	.526	.135	.182	.193	.253	-											
12. INT-1	.021	.045	.000	.131	.022	.006	.034	.096	.133	.154	.017	-										
13. INT-2	.027	.057	-.035	-.055	-.040	.004	.057	-.003	.069	.166	.010	.230	-									
14. INT-3	.056	.111	.003	.011	-.025	.003	.052	.112	.179	.168	.022	.093	.161	-								
15. INT-4	.075	.149	.036	.031	.049	.077	.108	.034	.242	.114	.105	.184	.070	.142	-							
16. INT-5	.086	.103	.058	.021	.052	.072	.081	.071	.184	.152	.091	.215	.166	.314	.129	-						
17. INT-6	.101	.212	.081	.046	.052	.077	.104	.097	.277	.097	.096	.150	.100	.138	.410	.173	-					
18. INT-7	.008	.068	-.033	.034	-.021	.033	-.064	.037	.125	.191	.052	.119	.175	.163	.175	.143	.229	-				
19. INT-8	-.256	-.153	-.282	-.019	-.258	-.289	.006	-.170	.027	-.034	-.203	.034	.059	.057	.069	.048	.088	.133	-			
20. INT-9	-.325	-.241	-.355	-.069	-.312	-.322	-.057	-.128	.013	-.065	-.267	.028	.073	.039	.091	.040	.051	.117	.620	-		
21. INT-10	.070	.093	-.003	-.047	-.031	-.019	.039	-.002	.192	.258	-.008	.229	.238	.332	.140	.272	.081	.200	.046	.019	-	
22. INT-11	-.235	-.155	-.321	.004	-.287	-.282	-.137	-.155	-.013	-.045	-.217	.035	.061	.072	.083	.033	.089	.158	.520	.662	.086	-

APPENDIX G: THEORETICAL FRAMEWORK


Experiential Knowing
Intellectual Knowing
Experiential Knowing: Knowledge in which the body knows how to act (Tanaka, 2013). In this definition the body is not just simply a tool for knowing but is the center of knowing.
Intellectual Knowing: "Intellectual knowing is accomplished by the brain through thinking processes like analysis, pattern recognition, and generalization" (Adams, 1999). In this definition the mind is the center of knowing and the body is often referred to as a tool for knowing.