Mothers’ Epistemological Beliefs and Children’s Interpretation Understanding: A Conceptual and Empirical Inquiry into Knowledge Development

by

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B.A. (Hons.), Simon Fraser University, 2011

Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts

in the Department of Psychology Faculty of Arts and Social Sciences

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SIMON FRASER UNIVERSITY Summer 2014

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Abstract

The current project investigates relations between mothers’ beliefs about knowledge (personal epistemologies; PEs), mother-child talk, and children’s interpretation understanding. Conceptual analyses of belief and understanding were first conducted in order to clarify their usage in everyday grammar. Next, data from 38 mothers and their 6-8 year-old children was used to assess relations between mothers’ PEs, mother-child conversation about a storybook, and children’s interpretation understanding. Children’s receptive vocabulary, mothers’ parenting attitudes, and socioeconomic status were also assessed as covariates. The results of correlational and regression analyses showed a positive relationship between mothers’ PEs and children’s interpretation understanding when accounting for relevant covariates, including use of mental state terms. Furthermore, mother-child talk was positively associated with mothers’ PEs and children’s interpretation understanding, while the interaction between mothers’ PEs and mother-child talk negatively predicted children’s interpretation understanding. These findings suggest that relations with caregivers constitute one pathway from which children’s interpretation understanding emerges.

Keywords: knowledge development; personal epistemology; interpretation understanding; conceptual analysis; mother-child dialogue
I dedicate this work to my parents who sacrificed everything they had in hopes of building a better life for their children.
Acknowledgements

I thank Dr. Tim Racine for inspiring me to pursue an academic career, teaching me to never take anything at face value, and for challenging me to welcome uncertainty. I thank Dr. Jeremy Carpendale for sharing valuable knowledge and insight throughout the many stages of this thesis, and for encouraging me to consider alternative ways of thinking about development. I thank Dr. Lucy Le Mare for serving as my external examiner and for providing useful comments and recommendations for future work. I also thank Dr. Jack Martin for his helpful input and suggestions on conceptual analysis that helped shape much of my investigations.

I thank my partner, Minilik Joseph, for being my rock throughout the thesis writing process and for giving me his unconditional support, encouragement, and patience in my academic pursuits. I thank my parents, Ladan and Nassy Tafreshi, for instilling in me an insatiable curiosity for knowledge and understanding. I also thank my friend, Lisa Bitacola, for sharing in the graduate student experience, listening to my rants, and for lending a hand to the data collection portion of this project.

Finally, I acknowledge the hard work of three research assistants without whom the completion of this project would not have been possible, Michelle Spani, Nicole Spani, and Negina Khalil.
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Chapter 1. Introduction

Humans are unique in the extent of their ability to appreciate multiple perspectives. We can understand that although two people experience the exact same event, they might hold different beliefs or ideas regarding the details of the event. In other words, we hold a distinct ability to understand that individuals actively interpret knowledge. Further, we know that information in the world is subject to our interpretations; and therefore, we can understand that there are cases in which two or more individuals might have equally valid, yet different explanations, for the same phenomenon. That is, we understand the subjectivity of knowledge. For example, the statement, “I am waiting for a ring,” can be interpreted as waiting for a ring to wear, or as waiting for the telephone to ring. If this is the only information given, it is easy to understand why both of these interpretations could be equally plausible. From where does this capacity for interpretation understanding stem? What is the role of the interactional context in fostering such ability? These overarching questions are the motivating factors behind the following conceptual and empirical investigations into knowledge development.

Specifically, the current project focuses on the role of mother-child relations in the development of children’s interpretation understanding. The connection between mothers’ ways of talking about knowledge and children’s abilities to understand the interpretive nature of knowledge is examined. Hence, this project addresses both conceptual and empirical questions pertaining to epistemological development. Firstly, what is meant by interpretation understanding and what is meant by epistemological ideas or beliefs? How can we conceptualize these phenomena in a manner that is coherent given our everyday grammar? Secondly, once the sense of these concepts has been clarified, how do these phenomena interact in the world? Is there a relationship between mothers’ talk about epistemological beliefs, mother and child talk
about the subjectivity of knowledge, and children’s understanding of the subjectivity of knowledge?

I begin with an outline of the current state of research and theory pertaining to child social understanding and adult epistemological beliefs. This is followed by a discussion of the conceptual-empirical distinction and two sets of grammatical investigations: (1) an analysis of the description interpretation understanding and (2) an analysis of the description beliefs about knowledge and knowing. The implications of these conceptual analyses for the current project are considered, and an empirical investigation informed by the results of the conceptual inquiry is presented. Finally, the results and implications of the empirical project are discussed.

1.1. Theory of Mind and Personal Epistemology

In developmental science, the area of research concerned with children’s social understanding has long been encompassed by the concept theory of mind (ToM). Although it has been defined in numerous ways, ToM generally refers to the capacity for understanding one’s own and others’ psychological states (Carpendale & Lewis, 2006). The capacity for understanding interpretation is often categorized under this label as well. Similarly, adults’ beliefs regarding the nature of knowledge are generally encompassed by the concept personal epistemology (PE; Hofer, 2001). This section provides an overview of the predominant ways in which ToM and PE have been conceptualized in the research literature.

1.1.1. Theory of Mind

Although the title theory of mind suggests that children possess an actual theory of mental states, there are a number of different models of ToM that provide a variety of explanations of the concept that do not necessarily adhere to such a view. Here, I present an overview of the three major theories of ToM that begins with a discussion of the representational theory of mind that they all presuppose: (1) theory theory, (2) simulation theory, and (3) the nativist (innate) account. I also describe alternative
perspectives on social understanding that do not ascribe to the traditional cognitivist views of the ToM tradition.

Traditional perspectives on ToM tend to abide by the Cartesian supposition that understanding psychological concepts such as belief requires access to an inner and private mind. The most basic assumption of the major perspectives is that children must create representations of mental states, and in order to have psychological understanding, children must recognize mental representations as representations (i.e., children develop the ability to “metarepresent”; Perner, 1991). Accordingly, many theorists claim that children come to understand that individuals can hold different and false beliefs through the use of metarepresentation. The influence of this representational view of mind can be seen in the three prominent theories of ToM development. Although each perspective differs in explaining how children come to create and understand mental representations, most of the dominant theories in developmental science embrace the assumption that understanding another’s beliefs is tantamount to understanding the inner contents of their minds.

Researchers working from a theory theory perspective claim that children develop a “theory” of mental states that is used to understand others’ minds (Gopnik & Wellman, 1994; Perner, 1991). According to the “strong” theory theory perspective, children are claimed to be accessing actual scientific theories that they have created inside of their minds rather than mere mental representations (Gopnik, 2003). In opposition to the theory theory perspective, simulation theorists claim that the idea that children construct and use scientific theories to understand mental states grants children with an ability that is far too complex. Alternatively, they propose that children acquire the ability to adopt the perspectives of others through imagination. Essentially, simulation theorists assert that children imagine themselves taking the positions of others; and therefore, they are able to understand that different people can hold different mental states (Harris, 1991). That is, to simulation theorists, social cognition is a process of chronic introspection that includes changing the default setting of one’s own mind to fit others’ knowledge.
The *nativist* (or innate) account takes the ideas of representational ToM a step further by proposing that children are born with the correct module for engaging in representational thought (Baron-Cohen, 1995; Leslie, 1991; Spelke, 1994). Consequently, a child’s ability to understand mental states is taken to be constrained to specific domains of the child’s mind, and the capacity for passing a test of social understanding is innate to the child (Spelke, 1994). Recently, researchers have argued for this perspective using empirical studies. For example, Onishi and Baillargeon (2005) used a looking time paradigm to argue that babies as young as 15 months have a rudimentary ability to understand false beliefs. Essentially, infants were first familiarized to a particular scene in which a protagonist placed a toy in one of two different locations through the presentation of repeated trials. Next, the protagonist would leave the scene, and depending on the condition that the infant had been assigned to (i.e., true belief versus false belief condition), the infant either saw the object move to a different location or stay in the same location. Following this, infants either saw the protagonist re-enter the scene and reach for the object in the old location (possible event) or in the new location (impossible event). The events were labeled as *possible* and *impossible* based on the knowledge of the protagonist. Onishi and Baillargeon (2005) found that infants who witnessed impossible events had longer looking times than infants who witnessed possible events. They interpreted this as evidence for rudimentary false belief understanding in infants, and claimed that infants looked longer at impossible events because their expectations had been violated. Not only did they argue that the infants had a rudimentary capacity for false belief understanding, they also claimed that this understanding was innate (i.e., unlearned).

### 1.1.2. Alternative Perspectives on Social Understanding

Although it is acknowledged by most theorists that individuals do have a rich inner life that is sometimes private, the problem in traditional cognitivist views of social development is that they assume that everyday social interaction involving beliefs, desires, or intentions is similarly private and hidden. This perspective overlooks the experiential background that must be in place in order for a person, for example, to be able to say that they believe something is true. It also overlooks the fact that the best form of evidence of a person's belief is how they behave, including what they say of their
beliefs. It is these forms of evidence upon which we all rely when making a judgment about others' beliefs and understanding. Therefore, a developing child must also have to learn to make such judgments correctly in order to show that they have social understanding. This would involve a mastery of the circumstances in which such “belief talk” is justified.

The three previously described theories of ToM have received extensive criticism, but less attention has been directed to the representational theory of mind that they all presuppose. In taking social factors for granted, the major accounts of ToM perpetuate a nature-nurture dichotomy by treating biological/cognitive and environmental factors as separate from one another. Although some researchers, such as Hamlin (2013) and Bloom (2012), have attempted to reconcile this issue by providing explanations that combine “innate” accounts of ToM with socio-cultural factors, such approaches often treat social experience as a “trigger” for biologically pre-determined capacities. In other words, nature acts on nurture, but the two factors remain distinct from one another. In contrast, others such as Gottlieb (2007) have revealed the flaws in the dichotomization of genes and environment. Gottlieb (2007) argued that genetic and environmental factors act as a developmental process in which nature and nurture are in a constant and dynamic interaction with one another. Thus, adhering to a nature-nurture dichotomy neglects this interaction and instead perpetuates a highly restricted view of development.

Although the problematic assumptions underlying the nature-nurture dichotomy have been endlessly addressed, researchers continue to promote theories of ToM that seem to adopt these assumptions. As mentioned previously, such theories also tend to assume a perspective in which it is claimed, for example, that individuals only understand beliefs by accessing their inner mind, whether through a theory, a simulation, or an innate module. The problem with adopting such a dualistic approach is apparent when we consider the context in which many of the phenomena that are claimed to reside within the mind exist. For instance, although it is harmless to say that beliefs reside within the mind (i.e., we know what people might mean when they say something like that), the development of social cognition involves being taught how to talk about beliefs and the different uses for the term belief. Thus, from such an alternative
perspective, it is more accurate to say that beliefs exist within a complex sociocultural environment. At root, the problem is the dichotomization of inner and outer and mind and behaviour.

Alternative perspectives on social development, which include developmental systems theory, action-based approaches, embodied cognition approaches, and relational/constructivist accounts, will be broadly referred to here as relational-systems views (e.g., Allen & Bickhard, 2013, Carpendale & Lewis, 2004, 2006, 2010; Oyama, 2000). Although each of these perspectives differs in some respects, they share a common view that social understanding emerges through engagement in social routines and practices. Nature and nurture are not viewed as a dichotomy but rather as a dynamic, interacting process, and the mind does not exist independent of the body or environment. Despite the fact that we have our own unique perspectives and inner lives, the concept of mind that children need to acquire exists within social interaction. Biology and genes are of course necessary for children to develop social understanding; however, the role of genes is not deterministic and genes alone are not sufficient for social development. Rather, social understanding constitutes and is constituted within social contexts. For example, there is reciprocal influence between the concept of belief, the actual phenomenon of belief, and the social environment in which it exists. Furthermore, language also plays a crucial role in this perspective of social development. It is through conversations with others that children learn to use terms such as belief in culturally and historically accurate ways.

1.1.3. Personal Epistemology

Although most research on PE is fairly recent compared to the work on child social understanding, there are many similarities that one can draw between the two fields. Both areas are encompassed by mainly cognitivist accounts of development; however, there are also groups of researchers working in both areas that push for alternative, more ‘embodied,’ approaches. In the late 1960s, William Perry (1970) created the first stage model of epistemic development. Perry interviewed undergraduate students at Harvard University during each year of their degree. He found that students in the first year of their degree tended to take a dualistic approach
towards knowledge and knowing; whereas, students in higher levels of their degree appeared to be more skeptical about knowledge. Some students, at the highest level of their degree, moved past this skeptical stage into a post-skeptical way of thinking about knowledge. Such students accepted the subjectivity of knowledge and were able to commit to their own beliefs about knowledge. This shift between objective, skeptic, and post-skeptic thinking would come to characterize the field of PE.

Although researchers have also described PE using terms such as judgment, reflection, resources, and ideas, the description beliefs about knowledge and knowing appears to be the most frequently used by theorists to refer to PE; thus, epistemological beliefs are the focus of the current project (see Hofer, 2001; Niessen, Abma, Widdershoven, van der Vleuten, & Akkerman, 2008). Recently, researchers have begun to explore the relations between mothers’ epistemological beliefs and mothers’ parenting styles and attitudes. In particular, results from various studies have suggested that mothers who hold more complex PEs tend to have beliefs about caregiving that include the child as an active participant in the construction of knowledge, whereas mothers with simper PEs endorse more authoritarian methods of caregiving (Bond, Belenky, Weinstock, & Cook, 1996; Bond & Burns, 2006). In addition, Hutchins, Bond, Silliman and Bryant (2009) found that mothers with the most complex PEs also tend to use (and have children who tend to use) mental state words more often than mothers with simpler PEs. Such findings suggest that mothers with more complex PEs might also be more likely to engage in elaborative discourse about psychological states.

Over the years, a number of different theoretical models of epistemological development have been proposed. Three major frameworks are often referred to as the predominant ways in which contemporary researchers conceptualize epistemological beliefs: “trait-oriented”, “theory-minded”, and “resource-oriented;” under these frameworks, beliefs are taken to be akin to individual traits, theories, or sets of resources (Niessen et al., 2008, p. 31). Although particular models within these larger frameworks differ in some respects, such as whether or not beliefs about knowledge are unitary or context-specific, all of these models ascribe a concrete and internal form to PE that follows from a cognitive science tradition (Hammer & Elby, 2002; Niessen et al., 2008). For example, Hofer and Pintrich (1997) proposed a model of PE in which beliefs about
knowledge and knowing take on the structure of theories. Similarities can be drawn between this model and the *theory theory* model in ToM literature. Furthermore, Hammer and Elby (2002) have shown that many theories of epistemological development assume that beliefs about knowledge are trait-like in nature. That is, even though individuals might not always be aware of the particular beliefs that they hold, their beliefs manifest themselves as if they are dispositions or tendencies for acting in a certain manner. In addition, although researchers interested in PE do not directly discuss *mental states*, they typically imply that when a person expresses a *belief* or acts in accordance with a *belief*, that they are experiencing some kind of *mental state* that accompanies that belief. This is inherent in the internal form that is ascribed to beliefs in these perspectives. For example, it is presumed that individuals might not always be aware of their beliefs; however, if they are asked a question concerning a particular belief, said belief can be brought into consciousness, as if holding a particular belief is akin to being in a particular state of mind (Hofer & Pintrich, 1997).

To add to the confusion, researchers have sometimes used the terms *belief*, *knowledge* and *theory* in interchangeable ways when referring to PE. Hofer and Pintrich (1997), for example, describe beliefs as theories, but then also go on to suggest that theories are bodies of knowledge, implying that beliefs are forms of knowledge as well. But believing something to be the case is different in ordinary parlance than knowing something to be case, which seems to invite misunderstanding. In either case, the dominant theories of PE are united in assuming that beliefs are internal components of the mind (or perhaps attributes of the brain), and that they can be referred to interchangeably with mental states, dispositions, theories, and knowledge. Indeed, much of the empirical and theoretical work on PE over the past 40 years is explicitly cognitivist. Under a cognitivist framework, epistemological beliefs are treated as static entities that take on a concrete form within the mind. This assumption is adopted, for example, in King and Kitchener’s (1994) *reflective judgment* model, Baxter Magolda’s (1992) *epistemological reflection* model, and Hofer and Pintrich’s (1997) *epistemological theories* view. It is such a common presumption that beliefs about knowledge and knowing reside within and are the product of individual minds that researchers working in the area of PE have rarely, if ever, questioned such an assumption.
1.1.4. Alternative Perspectives on Epistemological Beliefs

Recently, different groups of researchers have begun to critique the traditional cognitivist approach described above. Such skepticism began with the work of Hammer and Elby (2002) when they proposed a resource model of epistemological beliefs, according to which epistemological knowledge is contextually situated. Although this model still ascribed an internal form to PE in that it construed epistemological resources as "fine grained knowledge elements that a student possesses" (Elby & Hammer, 2010, p. 411), it was an initial step at acknowledging the complexity of epistemological thought. Hammer and Elby (2002) recognized the rigidity of traditional models of PE and attempted to propose a less "in the head" account. Following their lead, authors such as Falmagne, Iselin, Todorova, and Welsh (2013) and Niessen, et al. (2008) argue that the internal form ascribed to PE is problematic. For example, Niessen et al. (2008) propose an 'enactivist' account of PE in which the line between body and environment is blurred, and instead, greater emphasis is placed on the complex and dynamic relations between persons. That is, epistemological beliefs are understood within the particular circumstances in which they occur. Falmagne et al. (2013) similarly address issues with conceptualizing persons as being constituted by parts and mentalistic properties. Rather, they propose a view of personhood in which the concept of mind is “continuous with the whole person” (Falmagne et al., 2013, p. 617). From such perspectives, it does not make sense to study beliefs about knowledge and knowing as properties of the mind, as if the mind is somehow a distinct part of a person that is private and separate from the person’s embodiment in the world.

Although such alternative proposals have been helpful in advancing theorization of PE, there still remains a great deal of conceptual uncertainty in the field. The same can be said for the study of children’s social understanding, which is engulfed in research on ToM. I argue that this is mainly due to the fact that the form ascribed to social understanding and PE is a conceptual concern and not a theoretical one. In particular, I argue that part of the lack of clarity in these research areas is due to the neglect of conceptual issues surrounding the terms understanding and belief. That is, researchers have not attempted to resolve conceptual issues through conceptual analysis per se; rather, conceptual issues have been tackled as if they were a matter of
providing more adequate operational definitions, theories, or empirical studies. There is no doubt that theory and method are important aspects of research, and that theoretical and methodological investigations can help advance understanding of particular concepts under study. However, a focus on theoretical and methodological issues has resulted in attempts at resolving disagreements that turn on the meaning of the concepts at play through theoretical proposals or refinement of measurement tools. Such an approach to conceptual analysis conflates empirical and philosophical issues. Drawing on the work of Wittgenstein, and his interpreters (e.g., Baker & Hacker, 2005; Bennett & Hacker, 2003; Hacker, 2013; Harré & Tissaw, 2005; Tissaw, 2013), I argue that conceptual clarity can only be advanced through conceptual or philosophical analysis, in particular, analysis of the usage of a particular term or description.
Chapter 2. The Conceptual-Empirical Distinction

In general, researchers studying child social understanding and adult PE tend to adopt the following basic assumptions regarding conceptual issues: (a) they are akin to operational definitional issues; (b) they can be resolved through theoretical proposals; and (c) they can be resolved through empirical testing. However, through the clarification of a conceptual-empirical distinction, each of these premises can be shown to be problematic.

Harré and Tissaw (2005) contend that researchers working in the social sciences tend to misunderstand conceptual problems by assuming that such issues can be resolved through the construction of operational definitions. For example, it is common for researchers to confuse the conceptualization of PE with its definition. PE theorists often claim to address conceptual issues through proposals of operational definitions that are meant to capture the ‘essence’ of the concept (e.g., Kuhn & Weinstock, 2002). Similarly, researchers working in the area of child social understanding often dismiss conceptual issues by claiming that they have adequately operationally defined the phenomenon of interest (e.g., Bloom, 2012). These researchers mistakenly confuse operational definitions for the meaning of the concepts involved. It is of course important to adequately define concepts under study; however, it is mistaken to assume that the meaning of a concept can be clarified through such definitions. The problem is that researchers’ definitions may not be coherent ways of using the concepts involved, and the only way to determine whether or not they are coherent is to conduct a conceptual analysis.

Unfortunately, however, researchers do not conduct conceptual analysis to clarify concepts; rather, they tend to get caught in a web of proposing theoretical explanations, assigning definitions under these perspectives, and then running empirical tests to confirm their theoretical and definitional proposals. Although researchers claim to
address conceptual issues through these practices, such empirical and theoretical work presupposes rather than clarifies the meaning of concepts.

For example, it is common for researchers working in both areas of child social understanding and adult PE to presume that we already know that understanding and beliefs are properties of a person’s internal mind (i.e., that they are mental states, dispositions, or some other property with an internal form) and that we just need to reconcile how these concepts operate and are structured within the mind in order to properly define the phenomena. That is, researchers tend to adopt a particular conceptualization of understanding and beliefs without conducting any form of conceptual analysis, but then also claim that the conceptual problem for these areas of study is the lack of a unifying definition. This definition, or ‘essence’, is treated as if it is awaiting its discovery. Further, researchers’ efforts to ‘discover’ what it means to understand or to hold a belief typically consists of putting forward theories of how understanding and beliefs work in the mind, and then running empirical tests to verify such theoretical proposals. However, this very presumption is the conceptual issue that is at stake for these areas of study, and it is an issue that cannot be resolved through empirical means or through theoretical proposals.

From a Wittgensteinian perspective, we cannot determine the meaning of understanding by testing whether or not a child’s understanding is correlated with their looking time or social-cognitive abilities. Similarly, we cannot determine the meaning of beliefs by testing whether a person’s belief about knowledge is correlated with his or her adoption of a particular learning style, or whether a particular measure of epistemological development captures an objective-subjective shift in thinking. Furthermore, if we do not conceptually examine the presumption that beliefs about knowledge take on an internal form, no myriad of novel theoretical proposals can inform us if our usage of the term belief is coherent. Concepts such as understanding and belief play a fundamental role in our lives and are therefore governed by our language-use. Accordingly, researchers can determine coherent usages of these terms by conducting grammatical investigations that explore their possible senses (Hacker, 2013; Harré & Tissaw, 2005). An empirical investigation of understanding or belief cannot reveal what it means to understand or to believe just as much as a philosophical or
conceptual investigation of these terms cannot provide answers to empirical questions involving facts about understanding or believing (Bennett & Hacker, 2003).

To illustrate this point, I draw on the work of William Perry (1970) when he first described the notion of a PE. Although Perry did not set out to describe epistemological development when he interviewed undergraduate participants at Harvard University, researchers often credit Perry with the ‘discovery’ of PE, or beliefs about knowledge and knowing. However, Perry could not have ‘discovered’ such beliefs about knowledge if he and others were not already aware of the concepts belief and knowledge and how such concepts are used, i.e., what such concepts mean. Similarly, nativist researchers claim that looking time procedures reveal what it means for an infant to understand a false belief (e.g., Baillargeon, Scott, & He, 2010). However, such researchers could not have ‘discovered’ this meaning if they did not already know what it means to understand. Although researchers might adjust or expand their understanding of a given phenomenon based on the results of an empirical study, empirical work itself cannot shed light on the meaning of concepts, as we must already be aware of the way in which concepts can be used in order to empirically investigate such concepts. Therefore, in order to clarify the coherent usage of a particular concept, we need not turn to theory or empirical inquiry; rather, we need only to look as far as our everyday use of the particular concepts of interest. Providing an overarching definition of social understanding or PE is not the central issue here; rather, the central issue in conceptualizing understanding and beliefs lies within the clarity of usage of these terms. As Wittgenstein remarked, problems of meaning are not empirical problems; in the psychological sciences, we cannot resolve questions of meaning by setting up studies to discover new information about particular concepts. Rather, we solve such problems by “arranging what we have always known” through an examination of our current and our possible language-use (as cited in Harré & Tissaw, 2005, p. 156).

In order to flesh out suitable usages of understanding and beliefs, one must conduct careful grammatical investigations of the terms that are at play. Since attempting to clarify all of the possible usages of these concepts would be beyond the scope of this project, I will focus on investigating whether the current use of the terms understanding and belief in child social understanding and adult PE literature is sound.
This will involve comparing different uses of these terms in order to determine what sorts of uses are coherent (Tissaw, 2013).
Chapter 3. Grammatical Investigations

Wittgenstein wrote extensively regarding the use of psychological concepts. *Understanding* and *belief* are not only concepts of interest to developmental researchers; they are concepts that are integral to the field of psychology. Hacker and colleagues have examined and elaborated upon Wittgenstein’s analyses of these concepts in numerous works. In this section, I draw from the work of Baker and Hacker (2005) to clarify the usage of *understanding* by developmental researchers, and I draw from the work of Hacker (2004) and Bennett and Hacker (2003) to clarify the usage of *beliefs* by PE researchers. Following these investigations, I will also assess the idea that *understanding* and *beliefs* are properties of a person’s mind or brain versus the idea that they are properties ascribed to whole persons. This will be addressed through a discussion of the *mereological fallacy* described by Bennett and Hacker (2003).

3.1. Understanding

3.1.1. Understanding as a Mental State

Baker and Hacker (2005) have conducted an in-depth analysis of Wittgenstein’s treatment of the concept *understanding*. Here, I address the assumption underlying most cognitivist explanations of child social understanding (i.e., ToM), namely, that understanding is akin to being in a mental state, or to some form of mental process. I focus on the following key points made by Baker and Hacker (2005):

a. Mental states have genuine duration; understanding does not.

b. Mental states are states that one is in; understanding is akin to ability.

According to Baker and Hacker’s (2005) interpretation of Wittgenstein, developmental researchers fall into the trap of conceptualizing *understanding* as a ‘source’ concept. That is, we often think that understanding is the necessary state that
underlies the manifestation of an act. Further, in thinking that understanding must be occurring in the background of behaviour, we immediately assume that understanding occurs within the ‘inner,’ or within one’s mind. It only makes sense then, from this perspective, that the issue in conceptualizing understanding revolves around how we conceptualize understanding within the mind. And thus, several proposals have been put forward in order to explain how understanding operates as a mental state (e.g., as a theory or a simulation process). However, such a construal of understanding takes for granted the difference between the uses of the terms state and understanding.

As Baker and Hacker (2005) note, Wittgenstein referred to the notion of genuine duration to distinguish mental states from concepts such as understanding. Mental states have genuine duration because they can be interrupted. For example, a person can be in a state of depression, but then get distracted and no longer be in that particular state. However, once the distraction disappears, the person can go back to being in a state of depression. Understanding, on the other hand, does not have genuine duration. For example, understanding that two people can hold different interpretations of the same event cannot be interrupted. If one understands the subjective nature of knowledge, there cannot be any form of ‘break’ in their understanding. Understanding is different from mental states in this way.

Further, mental states are states of consciousness and are therefore states that one is in (Hacker, 2004). However, the grammar of understanding does not denote a state of consciousness, i.e., we might say, “A is in a state of depression;” we would not say, “A is in a state of understanding.” Similarly, we might say, “A understands interpretation;” we would not say, “A is in a state of understanding interpretation.” Whereas people are in mental states, they exercise understanding. That is, it is more sensible to think of understanding as an ability or a skill than to think of it as a mental state. Further, in being similar to an ability, understanding is connected to rules. For example, understanding the subjectivity of knowledge is “a mastery of a rule-governed technique” (Baker & Hacker, 2005, p. 305). One might show such an understanding by providing an explanation of how two people can hold different yet plausible interpretations of the same event, thereby showing that they have mastered rules for the understanding of an aspect of subjectivity.
Even if we are to discount the idea that understanding is a mental state, some researchers will likely still be inclined to argue that understanding is tied to something ‘inner.’ In particular, it has been argued that understanding is a mental process. For example, Baker and Hacker (2005) address the issue of sudden understanding, as such sudden revelations of knowledge are easily misinterpreted as being accompanied by underlying mental processes. We tend to assume that there is some hidden process occurring at the mental level that allows a person to suddenly understand (or in the case of nativist theories of understanding, the process allows them to have a rudimentary understanding from birth; e.g., Spelke, 2000). However, Baker and Hacker (2005) state, “what warrants a person’s utterance, ‘now I understand!’ is not an inner state or process that he observes in foro interno, but the circumstances of the utterance (including his past learning and practice)” (pp. 306-307). In other words, it is not a hidden mental process that justifies the sudden exclamation of understanding; rather, it is the circumstances of the person.

3.2. Beliefs

3.2.1. Beliefs as Mental States

Similar to social understanding, researchers have also construed epistemological beliefs as mental states. When an individual states that he or she has a particular belief about knowledge and knowing, is this person experiencing a particular mental state? Is it the same to say that a person believes, for example, that knowledge is dualistic, as it is to say that a person is in a state of believing that knowledge is dualistic? Hacker (2004) provided a detailed comparison of the concepts belief and mental state in Of the Ontology of Belief, concluding that beliefs are not mental states. I focus on several of the key distinctions drawn by Hacker to apply his work to epistemological beliefs:

a. Mental states are states of consciousness; typically, when we talk about mental states, we refer to the particular state that one is in. The phrase, “she believes that knowledge is dualistic” is characterized by what a person believes to be so; whereas, the phrase, “she is in a state of believing that knowledge is dualistic” is characterized by a state that a person is in.
b. Being in a particular mental state is often accompanied by a particular feeling. We cannot feel, however, that we hold a particular belief.

c. Mental states have genuine duration; beliefs do not.

d. Mental states that are accompanied by feelings are also often accompanied by a distinct and recognizable facial expression. Beliefs are not accompanied by distinct and recognizable facial expressions.

e. A person can hold an infinite number of beliefs at once; however, a person cannot be in an infinite number of mental states at once.

There is a characteristic difference in the use of the terms belief and state. The use of these different terms implies different meanings. That is, the use of the term belief implies that a person is referring to a particular proposition that is believed to be so; whereas, the use of the term state implies that a person is in a particular state of being or state of consciousness. For example, a person can be in a state of depression; however, does it also make sense to say that a person is in a state of believing that they are depressed? This would be a nonsensical usage of belief and state because one is either in a state of depression or is not, there is no such thing as believing that you are in a particular state, and being ‘belief-ful’ in itself does not denote a particular mental state either.

Being in a particular mental state is often accompanied by a particular feeling. In some cases, for example, when we say that a person is in a state of depression, that person can also feel depressed. This is an attribute that distinguishes mental states from beliefs. We cannot feel that we hold a particular belief; as Hacker (2004) points out, it would be unusual to say something like “I feel belief-ful about the dualistic nature of knowledge.” What’s more, as mentioned in the previous section regarding understanding, mental states have genuine duration, but concepts such as belief do not. For researchers to suggest that it is possible for an individual to be unaware of his or her beliefs until they are brought into our consciousness (or until they are in the particular mental state for being aware of that belief), is to conflate beliefs with mental states. It is misleading to say that a person can take a break from holding a particular belief. Our beliefs endure until they are either changed or disregarded. Indeed, it would be strange for someone to say, “I believe that knowledge is dualistic; however, sometimes I get distracted and no longer hold this belief, only to have this belief come back when the distraction goes away.” Whereas, it would not be strange for someone to say, “I am in a
state of depression; however, sometimes I get distracted and no longer feel depressed, only to go back into a state of depression when the distraction goes away."

Finally, when we want to inquire about an individual’s PE, we ask them questions regarding their views on knowledge. We do not refer to their facial expressions in order to understand if they think that knowledge is dualistic; this would be impossible to do. On the other hand, as Hacker (2004) points out, we can try to decipher a person’s mental state by looking at their facial expression. For example, as noted, mental states that are accompanied by feelings often manifest themselves in a person’s facial expression. If a person is in a state of depression, he or she might look sad, and this would give us a clue about that person’s state of being. We might say that a person “looks like they are in a state of depression.” However, it would not make sense to say that a person “looks like they believe that knowledge is dualistic.” Furthermore, a person might hold a multitude of beliefs about knowledge and knowing at once. For example, a person might say that they believe in dualism in the sense that 1+1 is always equal to 2. However, that very same person might say that knowledge is more relativistic when we discuss subjective topics such as politics and social change. Thus, a person can hold an indefinite number of beliefs about knowledge at once, and these beliefs do not necessarily have to be consistent with one another. In contrast, a person cannot be in an indefinite number of mental states at once.

3.2.2. Beliefs as Dispositions

A common interpretation of the nature of PE assumes that beliefs about knowledge and knowing are dispositions; in particular, that they are traits. However, is it the same to say that a person believes that knowledge is dualistic as it is to say that a person has a disposition to believe that knowledge is dualistic? The first statement is characterized by what a person “believes to be so”; whereas, the second statement is characterized by what a person has a “disposition to do” (Hacker, 2004, p. 200). Here, I focus on two of Hacker’s (2004) key distinctions between beliefs and dispositions:

a. Dispositions are always manifested; beliefs are not always manifested.

b. Beliefs and dispositions explain behaviour in fundamentally different ways; that is, they are grounded in different forms of reasoning.
It is important here to distinguish between being *disposed* and having a *disposition*. Hacker (2004) explains that an individual can be *disposed* to think or behave in a particular way; however, this may never be manifested in the individual’s behavior. In contrast, *dispositions* are always manifested, and thus, although a person can be *disposed* to behave in a particular way even if they do not ever manifest this particular trait, the same person cannot be said to have a *disposition* to behave in a particular way if they do not ever manifest that disposition. To say that a person has a disposition that they have never exhibited is to use the term disposition in a nonsensical way. Hacker (2004) argues that *beliefs* on the other hand, do not have to be manifested; an individual can hold a belief that they never express (e.g., in an interview of personal epistemology, participants might respond by saying that they have never previously talked about their beliefs on knowledge, but nonetheless, they can articulate a belief when they are asked to do so), and so, beliefs are not akin to dispositions in this way.

Consider a person who consistently and frequently obeys authority figures; we might say that the person has a *disposition* to obey authority. If we were to explain the person’s behavior based on such a disposition, we might say that it is the person’s nature to obey authority. However, if we were to explain the person’s behavior on the basis of their belief, we would not be basing such an explanation on the person’s nature; rather, an explanation based on belief would have to be based on reasoning. In other words, we would need to provide some reasoning behind the person’s belief (e.g., she tends to obey authority because she *believes* that knowledge is dualistic and that in most cases, there is a ‘right’ and ‘wrong’). Thus, belief is also different from disposition in the way in which it explains behavior. Knowing this, does it make sense to say that a person’s belief about knowledge is a disposition, and would this belief have to be manifested? The grammar of belief implies that it does not necessarily have to be manifested, but dispositions are inherently manifested. Thus, one can hold a particular disposition involving knowledge (as seen in the previous example); however, to say that one’s belief about knowledge *is* a disposition is to conflate these two terms.
3.2.3. **Believing vs. Knowing vs. Theorizing**

A final clarification is made here between *believing*, *knowing*, and *theorizing*. What does it mean to say that someone holds a *belief* about *knowledge*? Does it mean that the person *knows* something about the nature of knowledge? Or does it mean that the person has a *theory* of knowledge? Here, I draw from the work of Bennett and Hacker (2003), as well as Wittgenstein (1974) in *On Certainty* to demonstrate that several important distinctions exist between *believing* and *knowing*:

a. Beliefs need not be based on public criteria; knowledge is always based on public criteria.
b. There exist different degrees of knowing; there are no degrees of belief (that are comparable to the degrees of knowing).
c. Knowing is akin to an ability; believing is not akin to an ability.

Firstly, for a person to say that they *believe* that knowledge is dualistic is to put forward a proposition about the nature of knowledge. This proposition need not be based on any form of public criteria. However, for a person to say that they *know* that knowledge is dualistic is to put forward a claim about what is true; in this case, this person would have to base this knowledge on some form of public criteria that justifies the *knowing* that the person claims. In other words, one can claim that one *believes* that knowledge is dualistic but not *know* that knowledge is dualistic, for knowledge does not have to actually be dualistic in order for a person to *believe* that it is. In contrast, it does not make sense to say that a person *knows* that knowledge is dualistic if it is not actually so (Bennett & Hacker, 2003). In this sense, one might say that a belief claim is less certain than a knowledge claim, but in either case, it shows the danger in using these terms interchangeably.

Second, another key distinction drawn by Bennett and Hacker (2003) between *believing* and *knowing* pertains to degrees of knowing. It is possible that a person might know something to a certain degree, but not know all of the information about that something. However, it does not make sense to say that a person holds a degree of *belief*. For example, one might say that one *knows* more about the study of epistemology than someone else. However, it would be odd to say that a person *believes* more about the study of epistemology than someone else. However, there are
grey areas here because perhaps one might believe more in the theory of evolution than someone else who is not as convinced. But this is just to say that one has doubts about evolution and is therefore not a case of degrees of belief per se. In a similar way, a person may have more *faith* in the study of epistemology, but this is different from *believing* (Bennett & Hacker, 2003). To put this differently, a person can hold more *knowledge* about a particular topic than someone else, but they cannot be more ‘beliefful’ about a particular topic.

Finally, *knowing*, like *understanding*, is similar to having an ability, for knowing that something is thus-and-so means that we are able to act in accordance with that knowledge (i.e., that we have an ability). However, *believing* that something is thus-and-so does not necessarily mean that we have a particular ability to act in accordance with that belief. In sum, it is vastly different to *believe* something than it is to *know* something. This is not problematic for the study of personal epistemology if researchers are careful not to use these terms interchangeably. However, it is problematic in cases where a belief about knowledge is said to be a form of knowing. For example, Belenky, Clinchy, Goldberger, and Tarule, (1986) refer to their model of epistemological development as *Women’s Ways of Knowing*. Is this the same as capturing women’s ways of *believing* about epistemological beliefs? Such a distinction is not clarified in their model; however, as I have shown, *believing* and *knowing* cannot be used interchangeably, therefore, researchers must be careful in their usage of these terms.

Similarly, although *theories* do not denote *truth* in the same way as *knowing* does, theories are different from beliefs in that they too should be based on some form of public criteria. If I say that I have a belief that knowledge is dualistic, I do not need to justify such a belief on any grounds. However, if I say that I have a *theory* that knowledge is dualistic, I should be able to provide a rationale for this theory, particularly if this theory is in any sense similar to a scientific theory as such folk theories are often claimed to be. Our theories are often based on careful observation; whereas, our beliefs do not necessarily have to be based on any form of evidence. In other words, it would be okay for a person to say, “I believe in the dualistic nature of knowledge, although I have no evidence on which to base my belief”; whereas, it would be strange for a person
to say, “I theorize that knowledge is dualistic, although I have no evidence on which to base my theory.”

3.2.4. The Mereological Fallacy

As previously described, the dominant perspectives on child social understanding and adult PE tend to assume that understanding and beliefs are internal to a person’s mind. This is often taken to be analogous to the human brain, or a structure that exists within the head or brain; therefore, an examination of the relations between understanding, beliefs, and brains is also relevant to the current discussion. Researchers such as Martin and Bickhard (2013) and Niessen et al. (2008) have contested the idea that understanding and beliefs are attributable to some kind of inner entity. Rather, these researchers prefer to attribute these concepts to persons. Thus, in this section, I conceptually examine the relations between understanding, beliefs, brains, and persons. In particular, I draw points from Bennett and Hacker’s (2003) notion of the mereological fallacy of attributing to parts of an organism that which is only attributable to the entire organism; however, the following points can also be made for the relations between understanding/beliefs and the mind (especially since it is unclear what type of distinction cognitive researchers wish to make between a brain and a mind). Consider the following phrases:

- “A understands/believes that knowledge is dualistic”
- “A’s brain/mind understands/believes that knowledge is dualistic”

Whereas the first statement seems quite sensible and common, the second statement is uncommon. When we attribute understanding or a belief to an individual, we attribute it to the person as a whole, not to a particular part of the person, such as their brain or mind. This mistake of “ascribing to the constituent parts of an animal, attributes that logically apply only to the whole animal” is the mereological fallacy (Bennett & Hacker, 2003, p. 73). For it is not the person’s brain or mind that engages in the act of understanding or believing; rather, it is the person herself who understands or believes. Given the rules laid out in our everyday grammar regarding the use of the terms understanding and belief, the brain, or the mind, cannot logically be ascribed the functions of understanding and believing. Rather, these functions must be ascribed to
whole persons situated within particular circumstances. Bennett and Hacker (2003) illustrate this point by providing the example of the religious believer. They state that when a person claims that they have a belief in God, we can imagine what kind of person they might be (i.e., they may be a religious person). However, we cannot imagine what kind of brain or mind they have just by the mention of their belief. Similarly, if a person is an expert in the game of chess, we can once again imagine what kind of person they might be (i.e., they might be a person who is highly trained in the game of chess). However, we cannot imagine what kind of brain or mind they have based on their understanding of chess. Beliefs and understanding, therefore, are related to whole persons, not parts of persons, and researchers are mistaken to access beliefs, or to conceptualize understanding, as if they are entities or processes belonging to brains or minds.
Chapter 4. Implications for Current Project

The current empirical project concerns the relations between children’s interpretation understanding and mothers’ beliefs about knowledge. The above theoretical discussion and conceptual analyses inform this project in a number of ways. This section outlines the implications of the above discussions for the conceptualization of the phenomena of interest in the current study, as well as the implications for the methods used to assess these phenomena.

4.1. Conceptual Implications

The previous grammatical investigations inform the conceptualization of understanding and beliefs in two critical ways:

1. Children’s interpretation understanding is not akin to a mental state or mental process. Rather, such understanding is more akin to an ability, and understanding is shown by behaving in ways that correspond to the rules that govern a given form of understanding. Therefore, traditional cognitivist accounts of child social understanding that conceptualize understanding as being ‘in the head’ are nonsensical. Alternative relational-systems accounts of social understanding use the concept understanding with greater coherency than cognitivist accounts.

2. Mothers’ epistemological beliefs are not akin to mental states, dispositions, theories, or bodies of knowledge. Rather, beliefs are attributable to whole persons, and therefore, alternative enactivist accounts of PE use the concept belief with greater coherency than traditional cognitivist accounts.

Given these conclusions, we can think about child understanding and adult beliefs as properties of persons that are embedded in particular circumstances within a larger socio-cultural and historical context. Such a conceptualization illuminates the role of interaction between the mother and child in creating a context that constitutes the development of social understanding. An important aspect of this context involves
conversation and dialogue between mother and child. Since understanding and beliefs are embedded in our circumstances, one pathway from which such phenomena should develop is through rapport between a caregiver and a child. In turn, children’s understanding and mothers’ beliefs maintain a reciprocal influence with interactions and with one another, influencing the particular circumstances of a given situation.

4.2. Methodological Implications

The above discussion implies that it is through social interactions in which children experience conversations about the mind and mental states that they learn to understand concepts such as knowledge as they exist within the social world. Indeed, researchers have paid a great deal of attention to the use of mental state terms by parents and children, documenting both their frequency of use and their relations to ToM development (Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003). For example, Dunn, Brown, and Beardsall (1991) looked at the frequency with which parents used feeling state terms when speaking with their 36-month-old children. When the same children were 6 years of age, they tested their understanding of emotions with a perspective-taking task. The results showed that parents who more frequently used feeling state terms also had children who scored higher on the social-cognitive task later on. Similar results have also been revealed when looking at parent-child talk at different ages and examining varying facets of ToM such as false belief understanding (e.g., Ruffman, Slade, & Crowe, 2002; Ruffman, Slade, Devitt, & Crowe, 2006).

Although the study of mental state terms has revealed a relationship between the use of such words and social-cognitive development, much of the research conducted within this area has focused on pinpointing single terms or short phrases. Much less work has been done looking at the context within which the relationship between talk about mental states and ToM occurs. There are many instances in which words that may not appear to fall into the category of mental state references do actually convey meaningful talk about the mind (Turnbull, Carpendale, & Racine, 2008; Turnbull, Carpendale, & Racine, 2009). For example, in attempting to elicit talk about a character’s interpretation of an event in a story, a mother might ask her child “what did each character say after watching this event?” No specified mental state terms are used
in this phrase; however, it still has the potential to elicit talk that implies an understanding of interpretive features of a story. Therefore, merely counting the number of mental state terms used within an interaction is not a sufficient method of capturing the significance of discourse in social development.

Further, a larger problem with many of the studies that attempt to relate mental state terms to ToM is the reliance on the causal assumption that mental states lead to behaviours (Racine, Carpendale, & Turnbull, 2007; Turnbull et al., 2008; Turnbull et al., 2009). Researchers who adopt this outlook tend to view words as exact representations of the things that they refer to. In the case of mental states, for example, the term belief refers to a state of belief that exists within the mind. Researchers who presuppose this representational framework also contend that children will only understand a particular behaviour if they are exposed to the mental state terms that caused the behaviour (e.g., Meins et al., 2002). It is argued that when a child is exposed to a specific mental state term, she can map that term onto the appropriate mental state in the mind. However, this argument does not hold when considering that the meanings of mental state terms such as believe and know are embedded within the context in which such terms are used. As the previous grammatical investigations have shown, knowing and believing are not states of mind or mental processes; therefore, assuming that children learn to talk about such terms through mapping is nonsensical. In fact, it can be argued that even labeling these concepts as ‘mental state terms’ is nonsensical, as it has been shown that knowing and believing are not really mental states at all. Further, it was also shown in the above conceptual analyses that understanding is akin to an ability, and that understanding comes about from our particular circumstances. Thus, in trying to examine children’s development of social understanding, one must consider the larger context within which these circumstances exist, and not merely focus on individual terms.

It is thus proposed that children do not map terms onto their minds; rather, an important method of learning about mental states is by engaging in talk about them. In addition, the mind is not just a distinct entity that exists within individuals’ heads; therefore, it does not make sense to view the mind as the holder of various mental states that are disconnected from the social world (Racine et al., 2007). Indeed, Turnbull et al.
(2008) found that mothers’ use of elaborative talk, in which elements of a storybook regarding false belief understanding were discussed, predicted children’s false belief understanding above and beyond mothers’ use of mental state terms. These findings have led Turnbull et al. (2008) to question the role of mental state terms in ToM development. Instead, they suggest that the significance of mental state terms in ToM development depends on their use within the larger conversational context. Therefore, it is not really the use of mental state terms alone that influence children’s understanding of psychological phenomena (such as “interpretation”); rather, it is the overall dialogue that parents and children engage in regarding mental states that teach children to understand their use. Accordingly, rather than merely identifying mental state terms, the current empirical project will focus on talk involving important elements that pertain to children’s understanding of interpretation.

Furthermore, in assessing children’s interpretation understanding, one would want to choose an assessment that not only captures an instance of interpretation, but that also gives children an opportunity to demonstrate their understanding ability. Traditionally, as Lalonde and Chandler (2002) have pointed out, interpretation understanding has been investigated using false belief tasks. In the traditional false belief procedure, children are presented with a scenario in which a protagonist who is originally aware of the location of an object does not witness the re-location of the same object because he is away from the scene (Wimmer & Perner, 1983). When the protagonist returns to the scene, the child participant is asked where she thinks the protagonist will look for the object. The child passes the test if she can explain that the protagonist holds a false belief regarding the whereabouts of the object. Researchers have generally assumed that children must understand interpretation to be able to pass a false belief task (e.g., Wellman, 1990; Meltzoff & Gopnik, 1993). However, it is argued here that false belief tasks are not a sufficient measure of interpretation. Instead, a more suitable measure of interpretation would have to involve scenarios in which two or more individuals hold different beliefs with equal potential for truth (Lalonde & Chandler, 2002).

Lalonde and Chandler (2002) have argued that false belief tasks do not present any evidence for a child’s understanding of interpretation. Firstly, the protagonists
involved in false belief tasks do not experience the same event (Lalonde & Chandler, 2002). In fact, these tasks are carefully manipulated so that each character experiences a different event (i.e., at least one character must hold a false belief). This leads to the question, how can a child’s understanding of varying interpretations be assessed when all characters do not hold equally plausible interpretations of the same event? In false belief tasks, the different characters do hold dissimilar beliefs; however, these diverse beliefs are drawn from differing realities. Thus, although it is accurate to state that children who pass a false belief task show understanding of different beliefs, it would not be accurate to assume that the child understands interpretation. This is because the false belief task does not provide the child with an opportunity to represent the exact same event in varying ways.

Carpendale and Chandler (1996) have created an alternative method for testing children’s understanding of interpretation. These tasks involve several scenarios in which two characters, Mary and Maxi, always witness the exact same event. However, after each scenario, each character holds a different but equally plausible interpretation of the event that was witnessed. Upon watching these scenarios, children are asked to explain Maxi and Mary’s varying interpretations, as well as to predict what a third character, Ann, would think after witnessing the same event. Although children as young as 4 years of age (and arguably, 10 months of age; Luo, 2011) have been successful at passing false belief tests, most of the children under 6 years of age who participated in Carpendale and Chandler’s (1996) Mary and Maxi task were not able to show an understanding of interpretation. This finding is similar to the results of other studies conducted by Pillow and Henrichon (1996) and Pillow and Weed (1995), who also found that children younger than 6 years of age did not show an understanding of biased interpretations. This implies that Carpendale and Chandler’s (1996) tasks tap into an aspect of social understanding that traditional false belief tasks do not. It is not

1 Typically, researchers examining children’s interpretational abilities have referred to this capacity as “interpretive theory of mind,” perhaps as a way of connecting interpretational understanding to the larger body of work on theory of mind. Although the project proposed here follows in line with previous research conducted using the label “interpretive theory of mind,” I will not be adopting this label for the ability. Rather, because I will not be adopting a theory-based or representational account of interpretational abilities, I will be referring to the ability solely as “interpretation understanding.”
until at least 6 years of age that children begin to understand that a person can construct and alter their own conception of an event. Carpendale and Chandler's (1996) procedure will be used in the current study as it represents a conceptually coherent way of capturing children’s interpretation understanding, i.e., the understanding that two different characters can hold equally valid yet different ideas regarding the details of the same event.

Finally, the results of the above grammatical investigations suggest that mothers’ beliefs regarding knowledge and knowing should also be considered in context. Rather than asking mothers to introspect or to rate themselves on a PE questionnaire, a more efficient way of tapping into mothers’ epistemological beliefs might be to make use of an open-ended procedure that asks participants to talk about their beliefs and ideas in context, i.e., “how do you see yourself as a knower in the parenting context, or in a relationship context?” An assessment of epistemological development that is particularly sensitive to contextualizing beliefs about knowledge as well as gender-differences pertaining to such beliefs is the Women’s Ways of Knowing (WAYS) interview created by Belenky and colleagues (1986).

Belenky et al. (1986) conducted interviews with 125 women, asking them questions regarding their childhood, family, and educational experiences. Their work was highly influenced by Perry’s scheme of epistemic development; however, it was also a reaction to Perry’s use of mainly male Ivy League University students as participants in his interviews. Perry’s scheme was criticized for its lack of representation of women and individuals of lower socio-economic status. Belenky et al.’s (1986) new assessment of epistemic development accounted for these limitations by focusing on an all-female sample of participants from diverse backgrounds of varying socioeconomic statuses. Their work resulted in the creation of the WAYS.

The WAYS consists of a 5-stage model of epistemic development that captures women’s experiences in developing confidence in their own constructive power. Many of the women in Belenky et al.’s (1986) sample had experienced difficult cases of neglect and abuse; as a result, they did not use their own voices as a means of engaging with knowledge. Women at this level of epistemic development hold a
dualistic view of truth and do not question authority in its regulation of right versus wrong. At the opposite end of the spectrum, women who fall into the highest category of the WAYS model are active participants in the construction of knowledge. They view knowledge as a multifaceted concept – although they acknowledge that truth is not always readily accessible, this does not stop them from contributing to its creation.

It is not surprising that Bond et al. (1996) and Bond and Burns (2006) have provided evidence for mothers’ PEs having a relation to their outlooks on parenting. If a mother feels comfortable in expressing herself and engaging with knowledge, it is likely that she would also want to encourage her child to have a constructive role in knowledge creation. At the same time, if a mother does not feel comfortable in using her voice as a form of expression, she may have a more dualistic outlook on child development and focus mainly on teaching her child authoritarian values. Furthermore, if a mother tends to view the nature of knowledge as being complex and multi-faceted, then perhaps she would be more likely to talk with her child about the subjectivity of knowledge than a mother who holds a simpler PE. Thus, mothers’ PEs may play a crucial role in the quality of conversations between mothers and children. This raises the question, if mothers’ PEs are related to the way in which they talk to their children about psychological phenomena including knowledge in the world, will this, in turn, be related to children’s understanding of such phenomena?
Chapter 5.  Empirical Project

The question of how children develop an understanding of the subjectivity of knowledge is at the forefront of the current empirical investigation. In particular, the present study focuses on children’s abilities to understand that two characters can have dissimilar, yet equally valid, views of the same event. Unique emphasis is placed on the social interactional aspect of development (i.e., the mother-child relationship) as a platform for the emergence of essential concepts that allow children to talk about interpretation. In turn, mothers’ beliefs about knowledge and knowing are also examined as such beliefs should be related to how mothers engage in dialogue with their children. The age and language abilities of children were controlled using a standard assessment of receptive vocabulary. Similarly, since studies have shown a relationship between mothers’ PEs and SES (Belenky et al., 1986) and parenting beliefs (Bond et al., 1996; Bond & Burns, 2006), these factors were also assessed and treated as control variables. Furthermore, given the results of the grammatical investigations presented above, it is predicted that talk about important interpretational elements and mothers’ beliefs about knowledge should account for a portion of the variance in children’s interpretation understanding beyond the use of mental state terms. Thus, in light of the conceptual, theoretical, and empirical work described thus far, five overarching research questions were addressed in the following analyses:

1. **What are the relations between mother-child element talk (both interpretive and non-interpretive) and mother-child mental state talk?**  
   (1a) Is there a relationship between mothers’ element talk and children’s element talk?  
   (1b) Is there a relationship between mothers’ mental state talk and children’s mental state talk?  
   (1c) Is there a relationship between mother-child element talk and mother-child mental state talk?

2. **What are the relations between mother-child element talk (both interpretive and non-interpretive), mother-child mental state talk, and children’s understanding of interpretation?**  
   (2a) Is there a relationship between mother-child element talk and children’s understanding of interpretation?  
   (2b) Is there a relationship between
mother-child mental state talk and children’s understanding of interpretation? (2c) Does the number of interpretive elements present in mother-child talk account for more of the variance in children’s understanding of interpretation than the frequency of mother-child mental state talk, and other relevant control variables?

3. **What are the relations between mothers’ PEs and children’s understanding of interpretation?** (3a) Is there a relationship between mothers’ PEs and children’s understanding of interpretation? (3b) Do mothers’ PEs account for more of the variance in children’s understanding of interpretation than mother-child mental state talk and relevant control variables?

4. **What are the relations between mothers’ PEs, mother-child element talk (both interpretive and non-interpretive), and mother-child mental state talk?** (4a) Is there a relationship between mothers’ PEs and mother-child element talk during a picture-book interaction task? (4b) Is there a relationship between mothers’ PEs and mother-child mental state talk during a picture-book interaction task? (4c) Do mothers’ PEs account for more of the variance in the total number of interpretive elements present during the storybook interaction than mother-child mental state talk and relevant control variables?

5. **Is there an interaction between mothers’ PEs and the total number of interpretive elements present during the storybook task when predicting children’s understanding of interpretation?**

### 5.1. Methods

#### 5.1.1. Participants

Forty-two mother-child dyads were recruited for the purposes of the present study through advertisements and flyers posted in libraries, community centers, recreation centers, and online (Craigslist and Kijiji). Advertisements were geared at families living in the Greater Vancouver area. Four of the dyads were excluded due to missing/incomplete data \((N = 38)\). However, original sample sizes are retained for calculations of inter-rater agreement.

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[^2]: Two of the children in the dyads did not respond to the interpretation task and/or the language assessment, and two of the dyads did not speak English during the storybook interaction. One of the children in these dyads also did not respond to the language assessment.
Of the 38 children included in current analyses, 20 were female and 18 were male. Children’s age ranged from 6 years to 8 years and 7 months (M = 7.5). Twenty-five of the children were identified by their mothers as Caucasian, one as East Asian, one as Hispanic, three as South Asian, and eight children were identified as a mix of two or more ethnicities. Thirty-two of the children were from two-parent households, while six of the children were from single-parent homes. In addition, all but two of the children resided within the same household as their mother 7 days per week; one of the children resided in their mother’s home 6 days per week, while another resided in their mother’s home 5 days per week.

Of the 38 mothers included in the analyses, 26 identified as Caucasian, 3 as East Asian, 2 as Hispanic, 3 as South Asian, 1 as West Asian, and 3 mothers identified as a mix of two or more ethnicities. Thirty-four mother-child dyads spoke English as their primary language at home, while four of the dyads spoke a language other than English as their primary language. Overall, 21 of the dyads reported only speaking 1 language within their household, 13 dyads reported speaking 2 different languages, and 4 dyads reported speaking 3 different languages.

5.1.2. Materials

Videotaped sessions were captured using a Sony High Definition Handycam and the software program iMovie. Parent interviews were recorded using audio recording software on a MacBook Pro laptop computer, and child interviews during the interpretation tasks were recorded using a Sony hand-held IC recorder.

5.1.3. Measures

Women’s Ways of Knowing Interview

Mothers’ PEs were evaluated using questions adapted from the WAYS assessment (Belenky et al., 1986). WAYS is an audio-recorded, semi-structured, and open-ended interview. The adapted version of the interview that was used for the present project is identical to the version that was used by Hutchins et al. (2009; see Appendix A). This version of the interview includes six open-ended questions and six
statements that are read to the participant and followed up with probes in order to elicit in-depth responses. The questions concern the beliefs the respondent has regarding her own ways of learning, thinking and knowing, as well as the beliefs she holds regarding learning, thinking, and knowing in general. As an example, one question asks: “When looking for an answer to things, can there be more than one answer that is really right?” Participants are then probed in regards to their relationships, family life, school experiences, and careers. The statements included in the interview concern women’s varying experiences within classroom settings. Each statement is read to the participant who is then asked to comment and share her own experiences. For example, one statement reads: “I enjoy playing the devil’s advocate. I find that I can learn more if I challenge other people’s ideas.” Once again, the interviewer may make use of probing questions in order to encourage in-depth and detailed responses.

Levels of Epistemic Development

Belenky et al.’s (1986) WAYS interview categorizes women into one of five stages of epistemic development. Participants classified under the first stage of the model are referred to as silenced knowers. Women in this category tend to feel voiceless and passive in regards to knowledge. Silenced knowers have a stressful relationship with authority; however, at the same time, they tend to view authority as the basis of knowledge creation. Such women do not indicate any ability to engage in introspection or to reflect on their own original ideas. When they are asked to describe their “self”, they reference their surroundings more often than their own unique talents. Women classified under the second stage of Belenky et al.’s (1986) model are referred to as received knowers. In this stage, women still very much feel inferior to authority; however, they actively seek answers from authority rather than just passively receiving rules. Hence, although received knowers begin to actively look towards others for guidance, they still do not feel comfortable with their own voice. In addition, women in this category tend to view knowledge in a dualistic and concrete manner and do not feel comfortable with grey areas and ambiguity. Next, those categorized within the third stage of Belenky et al.’s (1986) model are subjective knowers. When women enter into this stage, they begin to let go of a predominately dualistic perspective of knowledge and begin to question truth. For Belenky et al. (1986), the most significant shift between received knowing to subjective knowing is the decrease in the amount of reliance on
authority to pass down knowledge and rules. In this stage, truth no longer exists with authority; it exists within the individual herself.

Women who move into the fourth stage of the WAYS model are referred to as *procedural knowers*. Individuals in this category begin to view knowledge in a much more complex manner. Whereas a subjective knower typically trusts her intuition or gut feeling, a procedural knower connects with others in order to form her own beliefs. From this perspective, truth is not easily accessible and it often requires detailed analysis. Often times, this analysis involves perspective taking and attempting to understand an issue from various points of view. The last stage of the WAYS model of epistemic development categorizes women as *constructed knowers*. In this final stage, women realize their full potential for the construction of knowledge. Rather than only conducting analysis, constructed knowers participate in the creation of ideas and accept the notion that there may always be some conflict in the search for truth. Although constructed knowers recognize the subjectivity of knowledge, this does not stop them from committing to a certain way of thinking about knowledge. Constructed knowers are comfortable with sharing their own beliefs about knowledge with others and contributing to the overall construction of knowledge.

**Scoring of WAYS Interviews**

Interviews were transcribed and rated by two independent coders who categorized participants into the 5 levels of the WAYS. The primary rater coded all of the transcripts, while the secondary rater coded 35% (15 of 42) of the transcripts. The coding method used was adapted from the coding procedures used by Hutchins et al. (2009) and Weinstock (1989). Rather than just assigning one overall category of epistemic development to participants, Hutchins et al. (2009) and Weinstock (1989) assigned both primary and secondary codes (if necessary). A primary code is the epistemic stage that best captures the participant; however, a secondary code may also be assigned if the participant tends to lean towards a second epistemic stage. Overall, there are 17 possible codes (1-17 ordinal scale; 1 = silenced, 2 = silenced with received emerging, 3 = silenced and received equally present, 4 = received with some silenced remaining, 5 = received, 6 = received with subjective emerging, etc.). Higher ratings indicate more complex PEs, whereas lower ratings indicate less complex PEs.
Coders first read transcripts in detail before going through each interview and assigning a rating to various segments of the transcript. Different responses or portions of responses were assigned ratings depending on the context of the response. For example, a participant might be given a rating of 15 and a rating of 10 for different portions of the same response. It is up to the rater to decide whether or not the participant is conveying two different ideas within the same response, or if each of the ideas presented are related to one another. It is entirely possible for a participant to be more of a constructed knower in one domain and more of a subjective knower in another.

In order to keep track of responses, Hutchins et al. (2009) organized participants’ statements into *response units*. A participant’s highest rating within a response unit counts as their final rating for that unit. That is, the entirety of the response unit should be taken into consideration, rather than divided into parts. This is because a participant might express a simple and a complex view within the same response unit; however, the fact that they are able to express the more complex view indicates that they are not restricted to the simple view. Therefore, the participant should receive the more complex rating. For example, a participant might say “I believe that many things in life are black and white,” and a rater would be inclined to code this statement as *received*. However, the participant might follow up this statement with, “but, such things are only black and white because we participate in social conventions that construct our understanding of right and wrong.” In this example, the participant actually has a much more complex view of knowledge, and thus, the second part of this statement should be considered as part of the response unit, and the participant should be given the more complex rating that arises from the response.

Once coding of a given transcript is complete, each rater reviews the codes given to each response unit and identifies a primary and secondary rating. Primary codes account for more than 60% of the participants' ratings, and secondary codes account for about 30-40% (Hutchins et al., 2009). However, raters’ general sense of the interview is also taken into account when determining a final code. It is possible for a rater to decide to override the scoring of the response units if her general impression of the interview leads to a different overall rating than what the scores suggest. Hence, the specific
response units assigned by each rater do not necessarily have to be in agreement, as they are mainly used as guidance for the coder; however, the overall codes that each rater assigns to each transcript are examined for agreement. The overall codes assigned by each rater should fall within the same dominant epistemological category. Therefore, a maximum of 3-point difference between coders’ ratings on the 1-17 scale was considered an agreement; there are roughly four different ways for a participant to fall under the same primary category (e.g., subjective only, subjective with received remaining, subjective with procedural emerging, and subjective/received or subjective/procedural transition). Inter-rater agreement was calculated at 93% (3-point difference in agreement) and 80% (2-point difference in agreement). Disagreements were resolved through discussion.

**Interpretation Tasks**

Carpendale and Chandler’s (1996) puppet tasks were used to assess children’s understanding of interpretation. In these tasks, the child is presented with three different scenarios in which two puppets, Maxi and Mary, hold different but equally valid interpretations of the same event. The first scenario involves a *lexical ambiguity* task in which the child witnesses Maxi and Mary being told to wait for a “pear/pair.” Maxi and Mary are then asked what they are waiting for; Maxi will say that he is waiting for a pear to eat; while Mary will say that she is waiting for a pair of shoes (the order of presentation of the puppets is counterbalanced).\(^3\) The child is then asked both explanatory (e.g., “Is it silly for Mary to say one thing and Maxi to say another?”) and predictive (e.g., “If we ask Ann to wait for a pear/pair, what will she say she is waiting for?”) questions about the task. The second puppet scenario involves a *referential communication* task in which the child sees three pictures of blocks laid out in front of

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3 The Maxi and Mary tasks were counterbalanced for the order in which the researcher presented the puppets. In version A of the test (n = 20), Mary is mentioned first in each scenario and is associated with the pair of shoes, the red block, and the duck. In version B (n = 20), Mary is mentioned second and is associated with the pear to eat, the blue block, and the rabbit. Independent-samples t-tests were run to determine whether ratings assigned to the children differed based on the order of presentation of the puppets. Children’s scores on the explanatory questions did not differ based on the order of presentation of the puppets \([t(38) = .000, p > .05];\) Version A \(M = 3.70,\) Version B \(M = 3.70\), nor did their scores on the predictive questions \([t(38) = -.358, p > .05];\) Version A \(M = 3.15,\) Version B \(M = 3.30\), or their overall scores on the task \([t(38) = -.197, p > .05];\) Version A \(M = 6.85,\) Version B \(M = 7.00\).
the puppets. Two of the blocks are the exact same size, while one of the blocks is smaller. One of the larger blocks is red in colour, while the other is blue. A researcher tells Maxi and Mary that a sticker is hidden under the big block. Mary then says that she thinks the sticker is under the big red block, while Maxi says that he thinks the sticker is under the big blue block. And finally, in the third scenario, the child witnesses an ambiguous figure task in which an image of an animal that could be perceived as both a duck and a rabbit is presented to the puppets. Once again, Mary interprets the image as a duck, while Maxi interprets it as a rabbit. As with the first scenario, the child is asked both explanatory and predictive questions after both the second and third scenarios.

**Scoring of Interpretation Tasks**

Independent raters coded the Mary and Maxi tasks (N = 40). The primary rater coded all of the participant responses, while a secondary rater coded 70% of the responses (28 out of 40). When coding the explanatory questions, children received a score on a 0-2 point scale. Scores of 0 and 1 are both classified as fail scores, while a score of 2 is considered a pass score. Children received a score of 0 if they provided an irrelevant explanation for the question that was asked, or if they were convinced that one of the interpretations was correct and the other was incorrect. Children received a score of 1 if they provided only a partial explanation for the question that was asked. For example, the child might explain the puppets’ interpretations by creating a story for why the puppet would prefer a pear to eat instead of a pair of shoes, or they might respond by simply stating that Mary and Maxi are 2 different people. Children also received a score of 1 if they said that it makes sense that Mary and Maxi have different interpretations without any reason for why this is the case. Children received a score of 2 if they provided some information regarding the ambiguous content of the scenario (e.g., explaining to the researcher that she did not clarify what type of pear/pair the puppets should be waiting for). Overall, children received a total explanation score for their responses to the 3 explanation questions. The theoretical range for this score is 0-6, with higher scores indicating better performance on the interpretation task.

The prediction questions of the Mary and Maxi tasks were also scored on a 0-2 point scale. Children received a score of 0 if they were sure that the third character,
Ann, would definitely pick one of the interpretations (e.g., she would definitely be waiting for a pair of shoes). This would mean that it is possible that the child answered under the assumption that Ann could only represent “pair/pear” in one way. Children received a score of 1 if they were unsure about their prediction of what Ann would say. A score of 1 was also assigned to children who explained their predictions by attributing some form of preference to Ann. Children received a score of 2 if they responded by saying that they did not know what Ann would say. In explaining their answer, the child would have to indicate some sort of ambiguity in Ann’s preference or in the object in question itself (e.g., “I do not know which one Ann would want”, or “a pear/pair can be a pear to eat or a pair of shoes”). Overall, children received a total prediction score for their responses to the 3 prediction questions (the theoretical range being 0-6).

Children’s prediction scores were added to their explanation scores in order to determine a total score for each child on the interpretation tasks. The theoretical range for this total score is 0-12. An agreement between the two coders was considered as an absolute agreement between the ratings assigned by each coder for each response given by each participant. Inter-rater agreement was calculated at 83% and disagreements were resolved through discussion.

**Sam and Laurie Picture-Book Interaction**

Mother-child dyads were asked to create a story for the picture-book *Sam and Laurie* in a videotaped session. *Sam and Laurie* is a picture-book that contains no words; rather, it shows various images of the characters Sam and Laurie playing with their dog, Carp (see Appendix B). Carp is depicted as behaving nicely with Laurie (i.e., carrying her lunchbox, playing fetch, etc.) and behaving badly with Sam (i.e., digging up his garden, urinating on the floor, etc.). On the last two pages of the book, Carp is shown on a sidewalk biting on the pant leg of a boy while a truck speeds past. Sam and Laurie both see this event happen, and on the last page of the book, they are shown standing next to a police officer.

**Coding of Element Talk**

Mother-child talk about particular elements of the story was coded using an approach adapted from Turnbull et al. (2008). The lead researcher and a research
assistant first identified the major elements of the *Sam and Laurie* book. Turnbull et al. (2008) define storybook elements as “items or elements of information that taken together sequentially constitute the… story” (p. 7). Thus, the researchers identified the elements that are most critical to comprehending the main features of the *Sam and Laurie* story. Once this was complete, the various elements that were identified were separated into interpretation vs. non-interpretation elements. Interpretation elements are those that are crucial to understanding the interpretive features of the story. Overall, 14 non-interpretive elements and 33 interpretive elements were identified (see Table 5.1).

As noted earlier, 2 of the participants did not speak English during the storybook task; therefore, assessment of inter-rater agreement is based on a sample size of 40. The lead researcher coded each of the transcripts and the research assistant coded 33% of the transcripts (13 of 40). Like Turnbull et al. (2008) and Ruffman et al. (2002), it is assumed here that it is the frequency of talk about important elements of the story, rather than the proportion of elements discussed by each member of the dyad, that is of importance for children’s social-cognitive development. Therefore, the transcripts were coded for the overall number of interpretive and non-interpretive elements discussed by each dyad. In addition, the total number of interpretive and non-interpretive elements elicited and produced by the mother and child were also calculated. Coders were considered to be in agreement if they coded the same elements as being present and also if they coded the same person (mother or child) as eliciting and producing the element. Raters were 95% in agreement in coding the presence of non-interpretive elements and 96% in agreement in coding the presence of interpretive elements. Raters were 83% in agreement in coding who elicited the non-interpretive elements, and they were also 83% in agreement in coding who produced the non-interpretive elements. Finally, raters were 84% in agreement in coding who elicited the interpretive elements, and 79% in agreement in coding who produced the interpretive elements. Disagreements between coders were resolved through discussion.

**Coding of Mental State Terms**

Following in line with Turnbull et al. (2008) and other researchers working in the area (e.g., Dunn, Brown, & Beardsall, 1991; Ruffman et al., 2002), a single researcher coded mothers’ and children’s use of mental state terms using frequency counts. Words
counted as *mental state* terms were based on a list compiled by Turnbull et al. (2008), which includes words such as *want*, *prefer*, *believe*, and *know*. Several additional mental state terms not included in Turnbull et al.’s (2008) list were identified in the transcripts during the coding process: *feeling*, *guess* (e.g., “I guess”), *interpretation*, *perspective/view* (e.g., “what is his view?”), *tired*, *mean/meant* (e.g., “I mean to say…”), *calm*, *unsure*, *figure/figure out*, *confused*, *scared/afraid*, *shocked*, *attention*, *opinion*, *predict/prediction*.

Table 5.1  Overall Sam and Laurie Storybook Elements

1. Laurie is playing with Carp (throwing a frisbee)
2. Laurie and Carp are having fun while playing
3. Carp pees on the floor
4. Carp is misbehaving by peeing on the floor*
5. Sam is pointing his finger at Carp (yelling at him) for peeing on the floor*
6. Sam is mad/shocked at Carp for peeing on the floor*
7. Carp is pulling Laurie in a wagon
8. Carp is being helpful by pulling Laurie in a wagon*
9. Laurie is happy/enjoying herself while Carp is pulling the wagon*
10. Sam is working in the garden
11. Carp is digging up the garden to get a bone/or to bury a bone
12. Carp is being a bad dog by digging in the garden*
13. Sam is yelling at Carp for digging in the garden*
14. Sam is mad/shocked at Carp for digging in the garden*
15. Laurie and Carp are sleeping together
16. Laurie is happy/content while sleeping with Carp*
17. Carp is being a good dog by sleeping with Laurie*
18. Carp is chewing on Sam’s shoes
19. Carp is being a bad dog by chewing on Sam’s shoes*
20. Sam is not happy/is angry that Carp is chewing on his shoes*
21. Sam is yelling at Carp for chewing on this shoes*
22. Carp is carrying Laurie’s lunchbox
23. Carp and Laurie are trying to cross the street/get to school
24. Carp is being helpful by carrying Laurie’s lunchbox*
25. Laurie is happy that Carp is carrying her lunchbox*
26. Carp is barking at the cat/chasing the cat up the tree
27. Sam tells Carp not to bark at the cat/chase the cat*
28. Sam looks shocked/upset that Carp is barking/chasing the cat*
29. Carp is being a bad dog by barking at/chasing the cat*
30. Carp is biting a boy’s pant leg
31. There is a truck in the picture
32. The truck is speeding past the boy that Carp is biting*
33. Sam and Laurie both see Carp biting a boy’s pant leg*
34. Sam and Laurie look shocked that Carp is biting a boy’s pant leg*
35. Sam and Laurie are talking to a police officer/the officer asks, “what happened?”
36. Laurie tells the police officer that Carp is a good/helpful dog*
37. Laurie is overall happy with Carp*
38. Laurie tells the police officer that Carp was trying to save the boy*
39. Laurie and Carp did all good/fun/happy things together*
40. Sam tells the police officer that Carp is a bad/man dog*
41. Sam is overall unhappy with Carp*
42. Sam tells the police officer that Carp bit the boy’s pant leg*
43. Sam and Carp did all bad/not fun/mean things together*
44. Mention of ambiguity; we don’t know what really happened (Sam or Laurie could be right)*
45. Sam and Laurie have different interpretations/beliefs/ideas about what happened*
46. Sam is frowning/mad/upset while talking to the police officer*
47. Laurie is happy/smiling while talking to the police officer*

* Interpretive element

**Peabody Picture Vocabulary Test III**

The Peabody Picture Vocabulary Test III (PPVT III; Dunn & Dunn, 1997) was used to assess children’s language abilities. The PPVT III is a 20-30 minute norm-referenced assessment of children’s receptive vocabulary. Children are asked to match pictures to spoken words over a number of different trials. Children’s raw scores on the test were converted to standardized scores that reflect their linguistic abilities while taking their age into consideration. The theoretical range of scores is 40-160, where higher scores indicate higher linguistic ability. Reliability analyses of the PPVT III have yielded an internal consistency of alpha: .92 to .98. The PPVT III has also been correlated with measures of language comprehension (alpha: .69) and verbal ability (alpha: .91 and .89; Pearson Education, 2012).
Socioeconomic Status

Mothers’ socioeconomic status (SES) was assessed in two ways: (1) an objective measure of income and educational level and (2) a subjective measure of self-perceived SES. Although there is little consensus on an operational definition of SES, and little consensus on an ideal measurement tool, it is generally agreed upon in the literature that education and income are two of the best markers of an individual’s SES. Thus, mothers were asked to indicate their highest form of education, and their educational level was scored on a 1-4 scale (1 = elementary school, 2 = high school, 3 = some university or college, 4 = university degree). Annual income was also scored through self-reports on a 12-point scale (1 = less than $10,000 per year, 2 = $10,000 - $19,999 per year... 12 = more than 150,000 per year). Information for average annual income is missing for one participant; for analyses, the data point was imputed using mean substitution.

Parents’ conceptions of their economic and social statuses were measured using the McArthur Scale of Subjective Social Status (SSS; Adler & Stewart, 2007). Two different versions of the measure were used. The first version asks parents to define “community” in any way that is meaningful to them. They are then asked to place an X on a ladder to indicate where they see themselves in relation to their community. The higher they place the X on the ladder, the higher their standing within their community. The second version asks parents to place themselves on a ladder in relation to the rest of Canada. In particular, participants must place an X to represent their financial, educational, and occupational status relative to other Canadians. The higher the X is placed on the ladder, the higher their standing within Canada. There are 10 steps on each ladder; therefore, participants rate themselves on a 1-10 ordinal scale. If participants placed an X in-between two steps, their rating was coded as a half-mark between the two rings (i.e., if the X was placed between the 5th and 6th step, they were assigned a rating of 5.5).

Parental Attitudes Questionnaire

The mothers’ attitudes towards parenting styles were assessed using the Parental Attitudes Questionnaire (PAQ; Buri, 1991). The PAQ contains 30 statements
regarding the authoritative, authoritarian, and permissive parenting styles conceptualized by Baumrind (1971). There are 10 statements pertaining to each parenting style; participants rate their agreement for each statement on a 1-5 scale (the higher the rating, the greater the agreement). The total score for each of the 10 sets of questions is summed to provide participants with a score for each parenting style. Final scores range from 10-50 with higher scores indicating more agreement with each parenting style.

5.1.4. Procedure

Participants were pre-screened over the phone before they were deemed eligible to participate in the study. They were asked questions regarding their comfort level in answering long interview questions in English. Only mothers who were confident in their English fluency were asked to participate in the study. All testing sessions took place at the participants’ homes and were conducted by a lead researcher and a research assistant. Testing sessions were approximately 1-2 hours in length and guardians were reimbursed $10 per hour for their participation.

Mothers were first asked to complete consent forms and a demographic questionnaire. Next, both the mother and child participated in a videotaped session in which they were asked to create a narrative for the picture-book Sam and Laurie. After the picture-book session was complete, the mother was tested in one room with the lead researcher, while the research assistant administered the PPVT III to the child in another quiet room, followed by the Mary and Maxi tasks. While the child was being tested, the lead researcher asked the mother to complete the McArthur Subjective SES assessment and the PAQ. Finally, the lead researcher administered and audio-record the WAYS interview with the mother.
5.1.5. Results

Descriptive Statistics

Table 5.2 Descriptive Statistics for SES, Parenting Styles, Child Receptive Vocab, Child Interpretation Understanding, and Mothers’ Personal Epistemology ($N = 38$)

<table>
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<tr>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Variance</th>
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<tbody>
<tr>
<td>Mothers’ Level of Education</td>
<td>3.42</td>
<td>.60</td>
<td>2.00</td>
<td>.36</td>
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<td>Annual Average Household Income</td>
<td>7.79</td>
<td>3.45</td>
<td>11.00</td>
<td>12.17</td>
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<tr>
<td>SES Community Ladder</td>
<td>6.53</td>
<td>1.57</td>
<td>8.00</td>
<td>2.46</td>
</tr>
<tr>
<td>SES Canada Ladder</td>
<td>6.17</td>
<td>2.01</td>
<td>8.00</td>
<td>4.03</td>
</tr>
<tr>
<td>Permissive Parenting Endorsement</td>
<td>23.75</td>
<td>6.52</td>
<td>27.00</td>
<td>42.51</td>
</tr>
<tr>
<td>Authoritarian Parenting Endorsement</td>
<td>29.03</td>
<td>7.34</td>
<td>31.00</td>
<td>53.81</td>
</tr>
<tr>
<td>Authoritative Parenting Endorsement</td>
<td>43.00</td>
<td>3.42</td>
<td>13.00</td>
<td>11.73</td>
</tr>
<tr>
<td>PPVT Standard Score (Receptive Vocab)</td>
<td>107.08</td>
<td>12.20</td>
<td>60.00</td>
<td>148.83</td>
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<td>1.40</td>
<td>5.00</td>
<td>1.95</td>
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<tr>
<td>Interpretation Prediction Questions</td>
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<td>1.31</td>
<td>5.00</td>
<td>1.72</td>
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<tr>
<td>Overall Interpretation Score</td>
<td>6.87</td>
<td>2.33</td>
<td>9.00</td>
<td>5.42</td>
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<tr>
<td>Mothers’ personal epistemology</td>
<td>9.84</td>
<td>2.55</td>
<td>11.00</td>
<td>6.52</td>
</tr>
</tbody>
</table>

Descriptive information for control variables (SES, parenting styles, and child receptive vocabulary) is presented in Table 5.2. Most of the mothers in the sample completed at least some post-secondary education, and only two mothers did not attend post-secondary. The mean annual average household income for the sample was approximately $70,000; however, there was great variability in income. Five mothers reported an average household income of less than $30,000 per year, while 11 mothers reported an average household income of more than $100,000 per year. The mean rating of mothers’ subjective socioeconomic status was similar for both the community ladder and the Canada ladder. Ratings on both ladders also ranged from 2.00 to 10.00. The mean values of mothers’ endorsement of permissive and authoritarian parenting styles were similar; however, the mean value of mothers’ endorsement of authoritative parenting style was at least 10 points higher than ratings of the two other parenting categories. Finally, the variability of children’s standard scores on the PPVT was also quite large, with scores ranging from 80.00 to 140.00.
Descriptive information for children’s performance on the interpretation tasks as well as mothers’ PE scores is also presented in Table 5.2. Overall, 14 of the 38 children (37%) passed the explanation question of the lexical ambiguity task, while only 3 children (8%) passed the prediction question of the lexical ambiguity task. Twelve children (32%) passed the explanation question of the referential communication task, and eight children (21%) passed the prediction question of the referential communication task. Lastly, 20 children (53%) passed the explanation question of the ambiguous figures task, and 19 children (50%) passed the prediction question of the ambiguous figures task. The variability of mothers’ PE scores is also quite high with scores ranging from 6.00 (received knowing with subjective knowing emerging) to 17.00 (constructed knowing). Compared with previous research, both the lower bound and upper bound of PE scores for the present study are quite high. That is, Hutchins et al. (2009) had participants whose PE scores ranged from 3.00 to 13.00.

Table 5.3 Descriptive Statistics for Storybook Interaction (Mental State Terms and Element Talk; N = 38)

<table>
<thead>
<tr>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Mother-Produced Mental State Terms</td>
<td>17.39</td>
<td>13.31</td>
<td>46.00</td>
<td>177.11</td>
</tr>
<tr>
<td>Overall Child-Produced Mental State Terms</td>
<td>7.45</td>
<td>10.37</td>
<td>61.00</td>
<td>107.44</td>
</tr>
<tr>
<td>Interpretive Elements Present</td>
<td>9.74</td>
<td>3.78</td>
<td>14.00</td>
<td>14.31</td>
</tr>
<tr>
<td>Interpretive Mother-Elicited Elements</td>
<td>7.79</td>
<td>4.30</td>
<td>18.00</td>
<td>18.50</td>
</tr>
<tr>
<td>Interpretive Child-Elicited Elements</td>
<td>2.55</td>
<td>2.17</td>
<td>7.00</td>
<td>4.69</td>
</tr>
<tr>
<td>Interpretive Mother-Produced Elements</td>
<td>5.66</td>
<td>3.36</td>
<td>13.00</td>
<td>11.31</td>
</tr>
<tr>
<td>Interpretive Child-Produced Elements</td>
<td>6.25</td>
<td>3.28</td>
<td>14.00</td>
<td>10.73</td>
</tr>
<tr>
<td>Non-Interpretive Elements Present</td>
<td>11.47</td>
<td>1.57</td>
<td>8.00</td>
<td>2.47</td>
</tr>
<tr>
<td>Non-Interpretive Mother-Elicited Elements</td>
<td>7.82</td>
<td>3.03</td>
<td>11.00</td>
<td>9.18</td>
</tr>
<tr>
<td>Non-Interpretive Child-Elicited Elements</td>
<td>4.26</td>
<td>3.00</td>
<td>11.00</td>
<td>9.01</td>
</tr>
<tr>
<td>Non-Interpretive Mother-Produced Elements</td>
<td>4.87</td>
<td>2.55</td>
<td>9.00</td>
<td>6.50</td>
</tr>
<tr>
<td>Non-Interpretive Child-Produced Elements</td>
<td>9.39</td>
<td>2.21</td>
<td>10.00</td>
<td>4.89</td>
</tr>
</tbody>
</table>

Finally, descriptive information for mother and child mental state talk and mother and child element talk during the storybook interaction is presented in Table 5.3. The mean value for mothers’ production of mental state terms is much higher than the mean value for children’s production of mental state terms. However, the variability for both
mother- and child-produced mental state terms is also quite large. The mean value for the total number of non-interpretive elements present is higher than that of the total interpretive elements present. These findings are similar to those of Turnbull et al. (2008) who also found that the mean for the number of non-false-belief elements present during their storybook interaction was slightly higher than that of the false-belief elements. Overall, the mean values for mothers’ elicitation and production of both interpretive and non-interpretive elements are quite similar. However, the mean values for the number of non-interpretive elements elicited and produced by children are higher than the mean values for the number of interpretive elements elicited and produced by children.

5.1.6. Diagnostics

To control for Type I error, all analyses were conducted at an alpha level of .05.

Bivariate Correlation Analyses

The assumption of bivariate normality was assessed through the construction of Q-Q plots for each variable of interest. There was no evidence to suggest any major deviations; therefore, the assumption of bivariate normality was retained. In addition, the assumption of independence of observations is inherent in the design of the test.

Multiple Regression Analyses

Type II error was assessed by calculating the power of 1, 2, 3, 4, and 5-predictor models for a desired effect size. Since this is the first study of its kind assessing the relationship between such measures, Cohen, Cohen, West and Aiken’s (2003) suggested large effect size of $f^2 = .26$ was used. Using a power analysis formula (Cohen et al., 2003, p. 92), it was determined that the power of the current regression analyses to detect an effect size of $f^2 = .26$ is .60 - .70 in the 1-predictor models, .50 - .60 in the 2-predictor models, and .30 - .50 in the 3, 4, and 5-predictor models used in the subsequent analyses. Thus, although the power of the current data set is fairly adequate for the 1-predictor models, the current data set with a sample size of 38 is not satisfactory for detecting an effect size of .26 in the 2-5 predictor models. However, due to the difficult nature of the research questions (i.e., the need for mother-child dyads as
participants) the analyses will be run with the current data set; appropriate caution will be taken when interpreting these results.

The assumption of correct specification of the form of the relationship between each of the variables was confirmed through the use of scatterplots comparing the relations between each variable of interest. In addition, plots of the residuals versus predicted values depicted a cloud-shaped and even spread for each relation of interest; thus, there was no indication that the assumption of homoscedasticity of errors was violated. Furthermore, the results of histograms and Q-Q plots did not indicate a violation of the assumption of normality of errors. The assumption of independence of errors was checked using the Durbin-Watson test of lag 1 Autocorrelation. The resulting Durbin-Watson test statistics for each of the regression models in the subsequent analyses were tested against critical values. The results did not suggest a violation of the assumption of independence of errors; therefore, the assumption was retained. Multicollinearity was assessed using the variance influence factor (VIF). Multicollinearity is a concern if the VIF is greater than 10. A VIF was calculated for each term in each regression equation in the following analyses. None of the VIFs exceeded 10 (maximum = 2.355).
### 5.1.7. Control Variables

#### Table 5.4 Bivariate correlations between covariates and main variables ($N=38$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Child Age</th>
<th>Mother Education</th>
<th>Avg. Household Income</th>
<th>Community Ladder</th>
<th>Canada Ladder</th>
<th>Permissive Parenting</th>
<th>Authoritative Parenting</th>
<th>Child PPVT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.40*</td>
<td>0.45**</td>
<td>0.39*</td>
<td>0.35*</td>
<td>0.31</td>
<td>0.46*</td>
<td>0.59*</td>
<td>0.50</td>
</tr>
<tr>
<td>Totsal Number of Mental State</td>
<td>-0.01</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>-0.07</td>
<td>0.04</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Items Produced By Child</td>
<td>0.16</td>
<td>0.19</td>
<td>0.18</td>
<td>0.18</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.19</td>
</tr>
<tr>
<td>Items Produced By Mother</td>
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<td>0.27</td>
<td>0.23</td>
<td>0.25</td>
<td>0.28</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
</tr>
<tr>
<td>Total Non-Metaphoric Elements</td>
<td>0.05</td>
<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Educated by Child</td>
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<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
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</tr>
<tr>
<td>Total Non-Metaphoric Elements</td>
<td>0.05</td>
<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Educated by Mother</td>
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<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Total Non-Metaphoric Elements</td>
<td>0.05</td>
<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
<td>0.03</td>
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<tr>
<td>Present in Storybook 1st Task</td>
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<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
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<tr>
<td>Total Non-Metaphoric Elements</td>
<td>0.05</td>
<td>0.08</td>
<td>0.08</td>
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<td>0.06</td>
<td>0.03</td>
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<tr>
<td>Child Prediction Score</td>
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<td>0.06</td>
<td>0.06</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
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<td>Total Child Explanation Score</td>
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<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Mother Personal Epistemology</td>
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<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$
Pearson Product Moment Correlations (PPMCs) were run to assess the relations between the control variables (SES, child age, child receptive vocabulary, parenting styles) and main variables (mental state talk, element talk, mothers’ PEs, and children’s explanatory, predictive, and overall interpretation understanding) in the study (see Table 5.4). Positive correlations were found between average household income and children’s interpretation understanding. Children’s understanding of interpretation was also positively correlated with child age, and children’s standard scores for receptive vocabulary were positively correlated with the number of interpretive elements elicited and produced by the child. They were also negatively correlated with the number of non-interpretive elements produced by the mom. Finally, mothers’ PEs were positively correlated with mothers’ ratings on the community ladder, and they were also negatively correlated with the endorsement of authoritarian parenting techniques.

5.1.8. Research Question 1

The relations between mothers’ element talk and children’s element talk was first addressed through the calculation of PPMCs. Table 5.5 shows a positive correlation between mothers’ elicitation of interpretive elements and children’s production of interpretive elements during the storybook task. In turn, both mothers’ elicitation and children’s production of interpretive storybook elements were positively correlated with the total number of interpretive elements present during the interaction. This relationship was not found for the non-interpretive elements.

A positive correlation was also found between mothers’ production of mental state terms and children’s production of mental state terms. Mothers’ production of mental state terms was also positively correlated with mothers’ elicitation of both interpretive and non-interpretive elements in the storybook interaction. Furthermore, mothers’ use of mental state terms was also positively correlated with children’s production of interpretive storybook elements as well as the overall number of interpretive elements present in during the storybook interaction (see Table 5.5).
Table 5.5 Bivariate Correlations between Mothers' PEs, Children's Interpretation Scores, Element Talk, and Mental State Talk (N = 38)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>12</th>
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<th>14</th>
<th>15</th>
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</thead>
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<tr>
<td>2. Total Child Interpretation Score</td>
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</tr>
<tr>
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<td>.20</td>
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</tr>
<tr>
<td>6. Mom Elicit</td>
<td>.34*</td>
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<td>.21</td>
<td>.32*</td>
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<td>.15</td>
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<td>.74**</td>
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<td>-.05</td>
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<td>-.59**</td>
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<td>-.26</td>
<td>-.07</td>
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<td>14. Child Produce</td>
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<td>Total Mental State Terms Present</td>
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<tr>
<td>15. Mother Produced</td>
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<td>.04</td>
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<td>.53**</td>
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<td>.12</td>
<td>.10</td>
<td>.23</td>
<td>.25</td>
<td>-.03</td>
<td>.19</td>
<td>.40*</td>
<td>.09</td>
<td>.18</td>
<td>-.12</td>
<td>-.03</td>
<td>.17</td>
<td>.61**</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01
Since children’s receptive vocabulary scores were correlated with the number of interpretive elements elicited and produced by the children, partial correlations were run to control for the influence of child vocabulary. The results showed a positive correlation between the number of interpretive elements elicited by mothers and the number of interpretive elements produced by children, controlling for children’s receptive vocabulary scores ($r = .545, p < .000$). However, this correlation disappears when household income is also entered as a control variable in the partial correlation ($r = .208, p = .223$). In addition, children’s production of interpretive elements was positively correlated with the total number of interpretive elements present during the storybook interaction while controlling for receptive vocabulary ($r = .649, p < .000$). Lastly, children’s production of interpretive elements was also positively correlated with the number of mental state terms spoken by mothers while controlling for children’s receptive vocabulary skills ($r = .457, p = .004$).

5.1.9. Research Question 2

PPMCs were computed in order to assess the relationship between mother-child element talk, mother-child mental state talk, and children’s understanding of interpretation (see Table 5.5). No significant correlation was found between mother or child production of mental state terms and children’s scores on the interpretation tasks. In contrast, children’s total scores on the interpretation tasks were positively correlated with the total number of interpretive elements present in mother-child dialogue. More specifically, children’s scores on their responses to the prediction questions in the interpretation task were positively correlated with the overall number of interpretive elements present in mother-child talk, as well as the total number of interpretive elements elicited by the mother during the storybook interaction.

Partial correlations were produced to determine the relationship between children’s total scores on the interpretation tasks and the number of interpretive elements present in mother-child talk while controlling for child age. The results did not show a statistically significant correlation ($r = .224, p = .183$), suggesting that child age accounts for much of the variance in the correlation between children’s performance on the interpretation tasks and mother-child element talk. Interestingly, there was also no
correlation found between the number of interpretive elements elicited by mothers and children’s scores on the prediction questions of the interpretation tasks when controlling for household income \( (r = .281, p = .092) \). The positive correlation between the overall number of interpretive elements present and children’s scores on the prediction questions was also weakened when controlling for household income \( (r = .350, p = .040) \).

Table 5.6 Summary of Hierarchical Regression Analysis for Variables Predicting Children’s Total Scores on Interpretation Tasks in Research Question 2 \( (N = 38) \)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Child Age</td>
<td>1.104</td>
<td>.415</td>
<td>.371**</td>
</tr>
<tr>
<td>Avg. Household Income</td>
<td>.268</td>
<td>.093</td>
<td>.401**</td>
</tr>
<tr>
<td>Mother - Mental State Terms</td>
<td>.019</td>
<td>.032</td>
<td>.106</td>
</tr>
<tr>
<td>Child - Mental State Terms</td>
<td>-.012</td>
<td>.041</td>
<td>-.056</td>
</tr>
<tr>
<td>Total Interpretive Elements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.321**</td>
<td>.328**</td>
<td>.352**</td>
</tr>
<tr>
<td>( F ) for ( \Delta R^2 )</td>
<td>8.286**</td>
<td>.165</td>
<td>1.190</td>
</tr>
</tbody>
</table>

\*p < .05, \**p < .01

A hierarchical multiple regression analysis was conducted in order to determine if the number of interpretive elements present in mother-child talk accounted for a significant proportion of the variance found in children’s total scores on the interpretation tasks above and beyond the frequency of mental state terms used by mothers and children and relevant covariates (see Table 5.6). Although no correlation was found between mental state talk and children’s interpretation understanding, mental state talk was included in the regression analysis for theoretical reasons, as it has been found to be related to children’s social-cognitive development in the past. First, an F-test was conducted to assess the proportion of variance in children’s total interpretation scores
accounted for by child age and average household income as a set, as these control
variables were found to be positively correlated with children’s overall interpretation
scores in the bivariate analyses. The resulting $R^2$ was .321, and was statistically
significant $F (2, 35) = 8.286, p = .001$. That is, 32% of the variance in children’s
interpretation understanding was accounted for by a combination of child age and
average household income. It was found that with all else held constant, child age
significantly predicted children’s total scores on the interpretation task, as did average
annual household income (see Table 5.6).

Next, another F-test was conducted to assess the proportion of variance in
children’s total scores on the interpretation tasks accounted for by child age, average
household income, and mother and child use of mental state terms as a set. The
resulting $R^2$ was .328, and was statistically significant $F (4, 34) = 4.028, p = .009$. That
is, 33% of the variance in children’s interpretation understanding was accounted for by a
combination of child age, average household income, and use of mental state terms.
Change in $R^2 (\Delta R^2)$ was equal to .007 and an F-test of $\Delta R^2$ revealed that it was not
statistically significant $F (2, 33) = .165, p = .849$. Once again, it was found that with all
else held constant, child age significantly predicted children’s total scores on the
interpretation task, as did average annual household income; however, number of
mental state terms spoken by mother and child did not (see Table 5.6).

Finally, a third F-test was run to assess the proportion of variance in children’s
total scores on the interpretation tasks accounted for by child age, average household
income, use of mental state terms, and the total number of interpretive elements present
during the storybook interaction. The resulting $R^2$ was .352, and was statistically
significant $F (5, 33) = 3.479, p = .013$. That is, 35% of the variance in children’s total
scores on the interpretation tasks was accounted for by a combination of child age,
average household income, use of mental state terms, and the number of interpretive
elements present in the storybook interaction. $\Delta R^2$ was equal to .024 and an F-test of
$\Delta R^2$ revealed that it was not statistically significant $F (1, 32) = 1.190, p = .283$. In
addition, all else held constant, annual average household income significantly predicted
children’s total scores on the interpretation task; however, child age, number of mental
state terms spoken by mother and child, and total number of interpretive elements present did not predict children’s total scores on the interpretation task (see Table 5.6).

5.1.10. Research Question 3

Table 5.5 shows a strong positive correlation between mothers’ PEs and children’s total ($r = .56$, $p < .01$), explanatory ($r = .44$, $p < .01$), and predictive scores ($r = .53$, $p < .01$) on the interpretation tasks. In addition, partial correlations showed that the positive correlation between mothers’ PEs and children’s total scores on the interpretation tasks is sustained when controlling for child age, household income, mothers’ ratings on the community ladder, and mothers’ endorsement of authoritarian parenting styles ($r = .515$, $p = .002$).

Table 5.7 Summary of Hierarchical Regression Analysis for Variables Predicting Children’s Total Scores on Interpretation Tasks in Research Question 3 ($N = 38$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>SE $B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>Child Age</td>
<td>1.104</td>
<td>.415</td>
<td>.371**</td>
</tr>
<tr>
<td>Avg. Household Income</td>
<td>.268</td>
<td>.093</td>
<td>.401**</td>
</tr>
<tr>
<td>Mother - Mental State Terms</td>
<td>.019</td>
<td>.032</td>
<td>.106</td>
</tr>
<tr>
<td>Child - Mental State Terms</td>
<td>-.012</td>
<td>.041</td>
<td>-.056</td>
</tr>
<tr>
<td>Mothers’ PEs</td>
<td>.413</td>
<td>.118</td>
<td>.453**</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.321**</td>
<td></td>
<td>.328**</td>
</tr>
<tr>
<td>$F$ for $\Delta R^2$</td>
<td>8.286**</td>
<td></td>
<td>.165</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

A hierarchical regression analysis was conducted in order to determine if mothers’ PEs accounted for a significant proportion of the variance found in children’s total scores on the interpretation tasks above and beyond the frequency of mental state terms and relevant covariates. This time, child age and average household income were
entered in Block 1, mother and child production of mental state terms were entered in Block 2, and mothers' PEs were entered in Block 3. The F-test from Block 3 had a resulting $R^2$ of .717, and was statistically significant $F(5, 32) = 6.779, p < .000$. That is, 72% of the variance in children’s interpretation understanding was accounted for by a combination of child age, average household income, use of mental state terms, and mothers’ personal epistemologies. $\Delta R^2$ was equal to .186 and an $F$-test of $\Delta R^2$ revealed that it was statistically significant $F(1, 32) = 12.278, p = .001$. That is, mothers’ PEs account for 19% of the variance in children’s total scores on the interpretation tasks above and beyond child age, average household income, and mother and child use of mental state terms. In addition, with all else held constant, child age, average annual household income, and mothers’ PEs significantly predicted children’s total scores on the interpretation tasks; however, mother and child use of mental state terms did not (see Table 5.7).

### 5.1.11. Research Question 4

PPMCs were calculated to assess the relations between mothers’ PEs, mother-child element talk, and mother-child use of mental state terms (see Table 5.5). The results showed a positive correlation between mothers’ PEs and the total number of interpretive elements elicited by mothers ($r = .34, p < .05$). Similarly, a positive correlation was also found between mothers’ PEs and children’s production of interpretive elements ($r = .34, p < .05$). In contrast, no statistically significant correlations were found between mothers’ PEs and mother-child use of mental state terms.

Partial correlations were calculated and a positive correlation between mothers’ PEs and mothers’ elicitation of interpretive storybook elements while controlling for mothers’ scores on the community ladder and mothers’ endorsement of authoritarian parenting was found ($r = .344, p = .040$). However, there is no longer a positive correlation between mothers’ PEs and children’s production of interpretive elements of the storybook when controlling for child receptive vocabulary, mothers’ scores on the community ladder, and mothers’ endorsement of authoritarian parenting ($r = .320, p = .061$).
A hierarchical multiple regression analysis was conducted in order to determine if mothers’ PEs accounted for a significant proportion of the variance found in the frequency of mothers’ elicitation of interpretive elements above and beyond the frequency of mother-produced mental state terms. The number of mental state terms spoken by mothers was entered into Block 1, and PE scores were entered into Block 2. The F-test from Block 1 had a resulting $R^2$ of .281, and was statistically significant $F(1, 36) = 14.056, p = .001$. With all else held constant, mothers’ use of mental state terms significantly predicted the mothers’ elicitation of interpretive storybook elements (see Table 5.8).

Next, the F-test from Block 2 had a resulting $R^2$ of .349, and was statistically significant $F(2, 35) = 9.378, p = .001$. That is, 35% of the variance in the frequency of mothers’ elicitation of interpretive storybook elements was accounted for by a combination of mothers’ use of mental state terms and mothers’ PE scores. $\Delta R^2$ was equal to .068 and an $F$-test of $\Delta R^2$ revealed that it was not statistically significant $F(1, 35) = 3.661, p = .064$. It was found that with all else held constant, mothers’ use of mental state terms significantly predicted mothers’ elicitation of interpretive elements during the storybook interaction; however, mothers’ PE scores did not (see Table 5.8).
5.1.12. Research Question 5

Table 5.9 Summary of Hierarchical Regression Analysis for Interaction between Variables Predicting Children’s Total Scores on Interpretation Tasks in Research Question 5 (N = 38)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
</tr>
<tr>
<td>Mothers’ PEs</td>
<td>.465</td>
<td>.132</td>
<td>.510**</td>
<td>.559</td>
</tr>
<tr>
<td>Interpretive Elements Present</td>
<td>.098</td>
<td>.089</td>
<td>.160</td>
<td>.064</td>
</tr>
<tr>
<td>Interaction Term</td>
<td>-.082</td>
<td>.039</td>
<td>-.295*</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.337**</td>
<td></td>
<td></td>
<td>.414**</td>
</tr>
<tr>
<td>F for ΔR²</td>
<td></td>
<td></td>
<td>4.452*</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

Finally, an interaction term was created in order to determine if there was an interaction between mothers’ PE scores and the total number of interpretive elements present during the storybook task when predicting children’s total scores on the interpretation tasks. Variables were centered before creating the interaction term in order to reduce multicollinearity. A hierarchical multiple regression analysis was conducted; mothers’ PEs and the total number of interpretive elements present during the storybook task were entered separately into Block 2, and the interaction term was entered into Block 3. The F-test from Block 2 had a resulting R² of .337, and was statistically significant \( F(2, 35) = 8.904, p = .001 \). That is, 34% of the variance in children’s interpretation understanding was accounted for by a combination of mothers’ PE scores and the total number of interpretation elements present during the storybook interaction. With all else held constant, mothers’ PEs significantly predicted children’s total interpretation scores; however, the total number of interpretive elements present during the storybook task did not (see Table 5.9).

The F-test from Block 3 had a resulting R² of .414, and was also statistically significant \( F(3, 34) = 8.006, p < .000 \). That is, 41% of the variance in children’s interpretation understanding was accounted for by a combination of mothers’ PE scores...
and the total number of interpretation elements present during the storybook interaction and the interaction between these two variables. \( \Delta R^2 \) was equal to .077 and an F-test of \( \Delta R^2 \) revealed that it was statistically significant \( F (1, 34) = 4.452, p = .042 \). In addition, with all else being constant, mothers’ PEs significantly predicted most of the variance in children’s total interpretation scores. Interestingly, the standardized and unstandardized beta coefficients for the interaction term were negative values and were statistically significant. This indicates that the interaction between mothers’ PEs and the total number of interpretive elements present during the storybook task has a negative effect on children’s interpretation scores (see Table 5.9).

**Figure 5.1 Scatter Diagram of Mothers’ PEs Predicting Children’s Total Interpretation Scores Based on Total Number of Interpretive Elements Present during Storybook Interaction (N = 38)**

Low \( R^2 \) Linear = .553; Moderate \( R^2 \) Linear = .205; High \( R^2 \) Linear = .177
Figure 5.1 presents a scatter diagram of the relationship between mothers’ PEs and children’s interpretation scores based on the number of interpretive elements present during the storybook interaction (i.e., low, moderate, or high presence of interpretive elements). The corresponding R² values based on the low, moderate, and high presence groups are also presented. The figure shows that the effect of mothers’ PEs on children’s interpretation scores is greatest for those dyads that had a low frequency count of interpretive elements present during the storybook interaction.

5.1.13. Qualitative Portraits

The results for research question #3 indicate that mothers’ PEs accounted for 19% of the variance in children’s scores on the interpretation tasks above and beyond child age, average household income, and mother and child use of mental state terms. In order to illustrate the strong association between mothers’ PEs and children’s interpretation understanding in the current sample, I provide 4 excerpts from interviews with mothers in various stages of the WAYS epistemic scheme, as well as excerpts from the performance of their children on the interpretation tasks.

During the WAYS interview, when one woman was asked to comment on her experiences as a learner, thinker, or knower, she responded by discussing her family’s expectations of her. She stated, “We were always expected to study hard at school and go to university. It was just a given, so that’s always been my experience.” She further stated that “right and wrong perspectives” and “police and authority are just a given in my way of thinking.” Under the received view, women tend to bring up the expectations of those around them when they are asked to introspect about themselves. They look outwards to others’ expectations of them to describe their own beliefs. Furthermore, these women have a dualistic view of knowledge. They believe in right and wrong, obeying authority, and the certainty of truth. For example, when asked if she believes that there is an absolute truth, this woman stated, “For most things, there is an absolute answer that you’d get to in the end.” Her child also responded with dualistic answers to the interpretation tasks. For example, in each of the sets of prediction questions asked regarding Ann’s perspective, the child responded that Ann would be “really, really sure”
that she would be waiting for a pear to eat, that she would pick the blue block, and that she would think that the ambiguous picture depicted a rabbit.

Women in the subjective stage of the WAYS scheme begin to move away from a dualistic view of knowledge into a subjective one. However, although women in this stage are more open to the subjective nature of knowledge, their views on knowledge are still quite simple in the sense that they do not expect others to justify or give reasons for their opinions. For example, one participant stated, “His answer is correct for him and for me, my opinion, my answer is more correct for me.” In this sense, women in this stage uphold a ‘respect for opinion’ rule in which an individual’s reasoning for holding a particular perspective comes from within (e.g., gut feelings). Furthermore, this same participant also stated, “I tend to feel really strongly about– I don’t see other people as authority figures, you know, I will go and I will tell my boss I don’t think this is right and I’ll quit rather than stay in that situation.” Such women rely on their gut feelings and have a strong dislike of authority figures. Women in the subjective stage believe that their own opinions are just as valid as the rules set forth by authority. The child of the woman in these examples was able to grasp a sense of subjectivity in the interpretation tasks; however, she was unable to provide adequate reasoning for the subjectivity. For example, when asked what Ann would think in the lexical ambiguity task, the child replied that Ann would want “a pear to eat” because “she is starving.” Furthermore, the child was “not quite sure” if this response was truly accurate. That is, the child sensed the ambiguity of the task, but when asked to reason why there was subjectivity in Ann’s response, the child was unable to give a justification that did not appeal to matters of taste or personal situation.

Unlike women in the subjective stage of the WAYS, women in the procedural stage are not satisfied with gut feelings or personal opinion as a basis for knowledge. They demand reasoning and analysis in determining what perspective is most valid in a given situation. For example, one woman stated, “I just don’t take things at face value with my knowledge and background and I wouldn’t expect someone else to either.” In addition, women in this stage believe that “there can be more than one answer that’s right”, and they also do not believe that knowledge should be passed down from
authority figures; rather, they acknowledge the role of the learner in the education process. The woman from the example above further stated,

I would say that in a classroom that I would have, for example, I wouldn’t want the kids to think that I’m the authority. I’d want them to question me and I would want them to engage in social learning because I think that’s where they discover it themselves. Just being told is not going to stick.

These views on learning and knowledge are also reflected in her child’s responses during the interpretation tasks. For example, her child is able to reason why Mary and Maxi might both be correct in the referential communication task:

I think that Mary thinks it’s under the blue block because they’re both big blocks, so they could be either one and if they both say the same one, then they could both be wrong, so they both chose differently.

Lastly, the responses of one woman in the sample exemplified the constructed stage of the WAYS scheme. This woman stated, “I view knowledge as being context-specific and something that is kind of fluid and socially constructed.” She further stated, “I know I’m constructing my own understanding within a particular context, within a particular community.” Women in this stage not only understand the multi-faceted nature of knowledge, but they also understand their own role in constructing knowledge. This is the main difference between the procedural and constructed stages. For example, the participant in the examples above further stated, “knowledge is not definite, but it’s constantly being reshaped and redefined.” The responses of her child during the interpretation tasks were a reflection of these views. In the ambiguous figures task, the child was asked what a third character, Ann, would think the picture depicted, i.e., a duck or a rabbit. The child responded, “I don’t know what she would say.” And when asked why, the child responded that Ann could “imagine it’s a rabbit or a duck,” alluding to the fact that individuals have a constructive power over knowledge (i.e., they actively interpret knowledge).
5.2. Discussion & Conclusions

The current empirical project investigated the relations between mothers’ epistemological beliefs and children’s scores on an interpretation-understanding task. It also considered the role of the interactional context in such relations, as well as relevant covariates such as child age, child vocabulary, SES, and mothers’ endorsement of different parenting styles. Overall, the results showed that there is a strong association between mothers’ PEs and children’s understanding of the subjectivity of knowledge. In addition, mothers with more complex PEs elicited more talk regarding interpretive features of a storybook and had children who produced more talk about interpretive features of a storybook than mothers with simpler PEs. In turn, both mothers’ elicitation and children’s production of interpretive elements was related to the total number of interpretive storybook elements present during the mother-child interaction. Mother-child dyads that discussed the greatest number of interpretive storybook elements also had children who scored the highest on the interpretation-understanding tasks. These results indicate that mothers’ beliefs regarding the nature of knowledge are not only connected to mother-child rapport regarding subjective features of the storybook task, but they are also connected to children’s understanding of the subjective nature of knowledge.

Although past research suggests that there may be important relations between the use of mental state terms and children’s understanding of interpretation, the results of the current study do not support this thesis. No correlation was found between mother or child use of mental state terms and children’s scores on the interpretation-understandings tasks. Rather, in the current sample, mothers’ PEs accounted for a significant proportion of the variance in children’s interpretation understanding above and beyond mother and child use of mental state terms, as well as other relevant covariates such as child age and average household income. This is not to suggest that maternal beliefs or ideas about the nature of knowledge lead to interpretation understanding in children. Rather, the current study suggests that mothers’ beliefs and children’s understanding are both constituted by the mother-child relationship. They are developed within the same interactional context, and therefore, they also both contribute to the interactional context. That is, mother-child interaction is a dynamic and multi-
faceted phenomenon. The potential for contribution to the development of beliefs and understandings regarding the nature of knowledge is bi-directional and reciprocal within the mother-child interaction. The results of the current study contribute to our understanding of this complicated relationship.

Indeed, the results also show that the interaction between mothers’ beliefs about knowledge and the amount of talk regarding interpretive elements during the storybook task predicted children’s understanding of interpretation. Specifically, the number of interpretive elements discussed by the mother and child during the storybook task had a negative effect on the relationship between mothers’ PEs and children’s interpretation-understanding scores. That is, the fewer interpretive elements discussed by the mother and child, the stronger the association between the complexity of mothers’ PEs and children’s interpretation scores. This is not to suggest that more complex maternal PEs might be negatively associated with talk about interpretive features of the storybook task, or that talk about interpretive features of the storybook task might be detrimental to the relations between mothers’ beliefs and children’s understanding. Rather, these findings suggest that it is not mothers’ beliefs per se that account for the variance in children’s interpretation understanding; rather, this relationship is also influenced by the rapport between mother and child. As previously discussed during the prior conceptual analyses, beliefs are properties of persons, and are therefore constituted in our relations with other persons. Thus, it only makes sense that mothers’ beliefs about knowledge are related to children’s interpretation understanding through dialogue about the subjective features of knowledge.

Furthermore, unlike previous research findings (e.g., Hutchins et al., 2009), the current study did not find a relationship between mothers’ PEs and the use of mental state terms. Rather, a relationship was found between mothers’ PEs and talk about important features of the storybook session. This further suggests that mothers’ PEs are not tied to specific terms regarding mental states, but are rather connected to the broader circumstances of mother-child conversation. In the case of the current study, mothers’ PEs were related to the key aspects (i.e., the elicitation and production of interpretive features) of the storybook scenario.
The current study also found relations between mothers’ and children’s use of mental state terms during the storybook task and the number of mother-elicited elements and child-produced elements during the same interaction. It appears that mothers who elicit talk regarding the interpretive elements of the story are also likely to use more mental state terms, while children who produce more interpretive elements are also more likely to have mothers who use more mental state terms. These relations were sustained even when taking child receptive vocabulary into consideration. Further, mothers’ PEs did not account for more variance in mothers’ elicitation of interpretive features of the story than mother or child use of mental state terms and child receptive vocabulary. Thus, these results suggest an elaborate interchange between the use of mental state terms and talk about important elements of a storybook regarding the subjectivity of knowledge, as well as children’s linguistic abilities. Perhaps mental state terms alone do not account for the development of interpretation understanding; however, they do contribute to the dynamic interaction in which mothers and children engage when discussing important features of the storybook. That is, the number of important interpretive elements discussed by the mother and child is related to children’s understanding of interpretation, suggesting that it is important to take the overall content of mother-child dialogue into consideration rather than to merely focus on specific terms produced during the interaction.

Although mother-child element talk during the storybook task was associated with children’s performance on the interpretation tasks, this relationship was not sustained when controlling for child age. It may be that mother-child dialogue contributes to children’s social understanding, but that age accounts for much of the shared variance in this association. However, it could also be possible that with a sample of slightly older children (i.e., 9 years), age may not play as large of a role. Most of the children in the current study did not pass the prediction questions in the tasks, which may indicate that the tasks could be altered to better suit the abilities of the 6-8 year age range.

Furthermore, average household income was included as a measure of SES in the current study because it had been related to adult PE in past research. However, a surprising finding in the current sample was the strong positive relationship between
average household income and children’s interpretation understanding. This relationship, when considered with child age, accounted for much of the variance in children’s scores on the interpretation tasks. Sufficient information was not collected from the participants in the current study in order to examine this relationship further; however, this finding does suggest that there is a need in this area of research to examine more diverse samples of participants. The variability in average household income for this particular sample was quite high in comparison to other studies of child social understanding. A task for future research in the area will be to consider SES, and household income, in particular, when examining children’s social development.

Finally, taken together, the results show that children’s social understanding emerges from an intricate ecological niche in which mothers’ beliefs and ideas regarding the nature of knowledge, as well as their beliefs and ideas regarding their own role in the construction of knowledge, influence and are influenced by dialogue in an interactional context. That is, influence in the interactional context is multi-faceted; mothers’ PEs influence mother-child talk, but children’s talk also influences mothers’ PEs. Children’s social understanding, in turn, is also influenced by mothers’ PEs through mother-child talk. There are no direct causal relations that can be drawn from the current study; rather, the results inform our understanding of knowledge development by showing that social understanding is dependent on multiple sets of factors that are in constant interaction with one another.

In this sense, *relational-systems* theories of social development are applicable here. Dichotomizing nature and nurture, or mind and body, does not allow us to understand the dynamic relations involved in the current project. Rather, from a *relational-systems* perspective, the development of children’s knowledge understanding (i.e., interpretation understanding in particular) emerges from relations between persons (i.e., mothers and children) in which discourse regarding relevant features of the subjectivity of knowledge contribute to such emergence. Therefore, children’s understanding is not a mental state or mental process; rather, children develop interpretation understanding as if it is an ability that emerges from engagement in the relevant rule-guided practices regarding specific and relevant features of knowledge.
5.2.1. Limitations

There are several limitations to the current study. Since data were collected at participants’ homes, any influences of being in a laboratory setting were avoided. However, the presence of researchers inside the participants’ homes may have had an effect on the performance of the participants during the testing session. For example, when the mother and child were reading the storybook with one another, it is possible that the awareness of the camera recording them during the task altered the way in which they went about constructing the story with one another. Thus, the video recordings might not be the best representation of day-to-day interaction between the mother and child. Likewise, it is important to note that although researchers took precautions to minimize any possible distractions during testing, the fact that the study was set in participants’ homes meant that there were some distractions for many of the participants (e.g., other children or family members in the home at the time, phone calls, etc.). Nonetheless, having the testing sessions take place at participants’ homes allowed for a higher level of comfort for the participants by providing a more natural setting than what they would experience in a laboratory. In addition, it may have also been a contributing factor to the socio-economic diversity seen in the current sample, as lower SES families may not have the resources to commute to a University campus to participate in research studies.

In addition, since participants were recruited mainly through the use of advertisements, the present study might not accurately represent portions of the population who are unlikely to respond to advertisements. Caution will have to be undertaken when attempting to generalize the results. Furthermore, mothers’ PEs and mother-child dialogue are part of the larger dynamic and dyadic process of social interaction. Although examining such factors allows us to gain insight into the ways in which they influence children’s interpretational understanding, the present study is restricted by its focus on mother-child dialogue. However, the current project can provide a platform from which to conduct future studies in this area.

Finally, power analyses revealed that the power of the current study to detect a large effect size in the 3, 4, and 5-predictor regression models is quite low. This might explain why $\Delta R^2$ in several of the regression models was not statistically significant. The
sample size of the current study may merely be too small to detect such an effect. Similarly, average household income seemed to account for much of the variance involved in the bivariate correlations; however, with a larger sample size, we might see some of these bivariate relationships sustained. Alternatively, it is also possible that we would see entirely different findings with a different sample of the population as well, and that the current findings are not restricted by power but are features of the specific population that was sampled. This being said, it is should be noted that the current study does not have an adequate sample size to detect a large effect.

5.2.2. Furthering Understanding of Knowledge Development

My goal in the current project has been to further understanding of knowledge development. In doing so, I have made use of conceptual, theoretical, and empirical techniques, and as such, my other goal has been to show that each of these techniques has inherent value in research. If researchers aim to understand knowledge development, they would do best to consider the place of each of these techniques. For example, I have used a relational-systems approach to make sense of the results of the current study; however, there are other theoretical approaches that researchers could adopt in making sense of the results (e.g., theory theory, simulation theory, nativist). Therefore, it is crucially important that researchers examine the conceptual foundations of their research questions and their theories. My use of a relational-systems approach here is justified through my conceptual investigations, as I have shown that this approach uses the terms belief and understanding in conceptually coherent ways; whereas, other cognitivist approaches do not. Furthermore, my goal in using such an approach to explain my results is not to advance a particular theoretical stance; rather, it is to make use of theoretical discussion as a tool to help advance understanding in this research area.

The current empirical project is an exploratory investigation into mother-child relations and knowledge development. It shows that children’s understanding of interpretation does not simply develop through the mapping of terms to mental states. Rather, the current findings show the complexity of knowledge understanding and the importance of attributing such understanding to persons situated within particular
circumstances. It also raises several questions concerning the relations between persons for future empirical research to assess. For example, why does the number of interpretive elements discussed by mother-child dyads have a negative effect on the relationship between mothers’ PEs and children’s understanding of interpretation? Future work in this area should investigate why the level of complexity of mothers’ PEs is more important for predicting children’s interpretation understanding for dyads that engage in less talk regarding the subjective aspects of knowledge. For example, it could be the case that such dyads take other sorts of opportunities not assessed by the current project to engage in dialogue regarding the subjective features of knowledge with their children. However, it could also be the case that these dyads might have already built sufficient rapport regarding the subjectivity of knowledge and therefore did not use the storybook activity as an opportunity to elaborate on such topics. In contrast, mothers with children who are still learning about interpretation might be more likely to take the opportunity to talk about perspective-taking and the subjectivity of knowledge during the storybook activity. Furthermore, the current study shows the need for research in the area of child social understanding to take greater care in addressing variation in household SES. In particular, future research should ask, what is the role of SES and household income in children’s social development? And how much of the shared variance in the relationship between mother-child interaction and children’s social understanding is accounted for by child age? In addressing these questions, however, researchers should carefully assess the relevant conceptual foundations. For example, what do we mean by socio-economic status, and in what ways should this concept be assessed that are coherent given our everyday understanding of the phenomenon? Finally, as the current project shows that social development is a quite complex and multi-faceted phenomenon, it is hoped that future work in this area will adopt a more in-depth and perhaps qualitative inquiry into mother-child relations and knowledge development. The brief qualitative portrait presented above suggests that there is much to be gained from a qualitative analysis of mothers’ PEs and children’s social understanding.
References


Appendix A.

Women’s Ways of Knowing Interview

Hutchins et al., 2009 (adapted from Belenky et al., 1986)

I would like to ask you how you are as a learner, a thinker, or a knower. Some people grow up feeling like they are not good learners and they are not confident in their ability to learn things; other people are helped to become aware of their intelligence much more easily.

C1. What has been your experience as a learner/thinker or knower? (Explore how she sees herself as a knower in two domains: (1) the family and interpersonal relations; (2) school/work or at home.

C2. Do you think of yourself more as a speaker or as a listener? In what ways? Does it depend on the situation you are in, or the people you are with? Has this changed at all for you over the years? (Examples: Did you used to feel more voiceless? Or, did you used to have a hard time hearing and understanding others?)

C3. Thinking back over your life, how have you changed as a learner/thinker/knower over the years? How so? (Again, keep in mind the two domains: (1) interpersonal (2) school or work)

C4. Was there anyone who was particularly important to you in your growth as a learner/thinker/ knower, either by helping you to move on or by holding you back?

C5. When looking for answers to things, can there be more than one answer that is really right? Explain?

Can you think about a time when you disagreed with somebody about what was right or what was best? Describe. How do you decide what is best or right in situations like that? (Explore disagreements for (1) friends or peers, and (2) authorities such as parents, teachers, Drs.)

C6. How do these people (friends, authorities) get their knowledge of ideas?

C7. These are six statements made by women. I would like you to comment on each of these.

(a) Sometimes classroom discussions are so confusing. I tend to trust more what a teacher says than what a student says. The student is giving her opinions; it might not be the right one. The teachers are always more or less right.

(b) I like it when teachers show you, not just tell you what's what. I find it really hard to learn just from words.

(c) I like it when teachers aren't above us - aren't being the boss. I like making my own decisions about what I am going to learn.
(d) I had one teacher who was really special. She knew a lot herself, but she still had respect for whatever we had to offer in class. She had a way of elevating what a student said. She got a lot out of teaching us and learning from us, and we learned from her.

(e) I enjoy playing the devil's advocate. I find that I can learn more if I challenge other people's ideas.

(f) When I don't understand what someone is trying to tell me, I usually just sit there and act like I know what's going on. I usually don't ask any questions when I'm pretty sure that I just don't understand something.
Appendix B.

Sam and Laurie