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Theory of Mind and False Belief in Two-Year-Olds: The Smiling Butterfly is Happy

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Abstract

Theory of mind refers to the ability to conceive of the mental lives that underlie behavior — an ability that supports virtually all interpersonal interaction. The development of theory of mind has been attributed to various cognitive, social and environmental factors. The possession of theory of mind in toddlers has been a widely disputed topic, viewed as contingent on their understanding of false-belief as demonstrated in a standard false-belief task. However, recent studies suggest that the standard task may be a weak indicator for various reasons. It may not encompass what young children are truly capable of. Some research shows that by adjusting the demands or context of the standard tasks, children have a better chance of succeeding at them, thereby demonstrating aspects of theory of mind at a younger age. This study argues that naturalistic observations of toddlers' daily behavior suggest that young children may possess an awareness of mental states that ranges in availability depending on the context.

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[1] Blake, 1950.

Sarah Lawrence (and those who make its existence possible), for being my academic dream come true and for allowing me to begin to appreciate what it means to have the sweet "luxury of being wrong[2]," that is, to have choices and the freedom to make them.

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[2] And to Greta Fein and Patricia Kinney (1994) for enlightening me to the notion that it is indeed a luxury.

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1. Introduction

I have often wondered about these moments of clarity in which we somehow understand, without explicit knowledge, the intentions of other people. How can we persuade, predict, and empathize; how can we infer information from other people's behavior, react and simply make sense of it? The essence of my inquiry points at that which underlies virtually all social relationships however intimate or distant, and it revealed itself in this very exploration of the insights that human beings have into other people's minds. The inquiry is a longstanding one that spans decades of investigation, analysis and theorization by philosophers and psychologists alike, piecing together the history of thought and philosophy of the mind.

It is our very conception of the mind, our own mind and therefore the distinct minds of others, that allows us to comprehend, explain and predict other people's behavior. Without this capacity to infer other people's reasonings, notions that some of us might take for granted like understanding social cues or other people's beliefs, desires, opinions and intentions would be indecipherable. If we were to see someone frowning, we could assume the mental state sadness, disappointment or something of the like. We attribute meaning to the action of frowning, and connect it to an inexplicit emotional state. This capacity to apprehend the connection between someone's behavior and their mental states is thanks to a possession of theory of mind.

The term theory of mind is indicative of its definition. To have a theory of mind, in its most basic sense, is to possess the theory that human beings have mental existences and that these existences underlie behavior. With this comes the understanding that minds are unique and account for differences in belief, desire, hope, fear and the like. It also means that

humans can share and adopt other perspectives, an ability that some believe to have arisen with the advent of thought (Matravers, 2017).

More recent work that focuses on the human capacity to share mental states is mirrored in Piaget's earlier work on children's perspective taking abilities and his ideas about *egocentrism* (Doyle, 1987). Piaget suggested that very young children appear unable to imagine a situation from another person's point of view, that the way the child themselves experiences the world is also the way everyone else does. In exploration of these ideas, he developed tasks that tested a child's awareness of spatial perspective, that is, how things appear depending on where a person is located. Thus, these ideas were being explored long before the advent of the term in the late 1970's by David Premack and Guy Woodruff in their research with chimpanzees (De Bruin, 2014), and certainly long before the burst of theory of mind research in the past two decades.

That humans possess theories of mind is not questionable. What is an area of inquiry and debate, however, is the nature of the existence of theory of mind in the youngest among us — children. What do infants and toddlers understand about other people's minds? When do they really start to think about other people's thoughts and feelings? Do very young children have a theory of mind at all, and therefore how is theory of mind defined? Finally, how can we explore the answers to these questions and how have they been explored in the past?

This body of work reviews some of the existing literature that seeks to decipher the answers to these questions within the infant and toddler years. The reason for this age limitation, other than the need to remain within the scope of this project, is for the sake of its

controversial nature and relatively recent area of study[3]. In the past two decades, theory of mind research has made significant connections between the social, cognitive and linguistic realms of child development. These domains have been used to explain the theory of mind phenomenon and the motors that drive its development. Therefore, the following discussion of theory of mind will explore definitions, functions, potential processes of acquisition and development through various theoretical lenses. Some of the research that has already been done to investigate these questions and ideas will be highlighted. This precedes the second portion of this thesis, which includes a task carried out with seven two-year-old students in the afternoon class in the Early Childhood Center. The aim was to attempt to apply this verbal task to the two-and-a-half-year-old child and to explore their perspective taking abilities in the particular context of this play-based school. Naturalistic observations follow the task discussions to further elucidate the nature of the children's insights into mental states as well as their level of false-belief comprehension at this particular point in their lives.

[3] Indeed toddlerhood was at one point referred to as the 'dark age' in theory of mind research (see Meltzoff et al, 1999).

2. Literature Review

2.1 False Belief

An area of theory of mind research that has been considered to be integral to our understanding of it in young children is the ability to attribute false belief to another person. A test that determines a child's comprehension of false belief — a false-belief task — requires the participating child to make a claim about another person's mistaken belief. To attribute false belief is to understand (1) the difference between the subjective mind and the objective world, (2) that another person could have false knowledge about reality, and (3) that another person could have a belief different from the child's own. It is a cognitive turning point at which time the child will theoretically display their particular conception of mind and reality and their ability to attribute meaning to mentalistic terms like 'believe' and 'think' (Origgi, 2015). Indeed, success on false-belief tasks marks an important milestone in the development of theory of mind. As a result, some believe that it also marks the beginning of a coherent theory of mind in general, that it is the point at which children begin to understand that cognitive processes govern behavior.

The classic false belief task, developed by Heinz Wimmer and Josef Perner (1983) involves a change in location of an object. The child watches a participant observe an object in a particular location. Then they watch the participant leave the scene. The object is then moved to another location and as the participant returns to the scene to look for the object, the child must answer where they predict the participant will look for the object. In theory, older children and adults will say that the participant will look for the object in the original location because they were not present when the object was moved, and the young child will

say that they will look in the new location. The reasons for why young children answer this way are precisely what this thesis explores. Other iterations of standard verbal false-belief tasks have grown out of this initial study, but all aim to measure the same type of awareness in the child. In order to succeed at the task, the child, who, as Piaget suggested, is prone to applying their beliefs to others, must restrain this urge and instead attribute a false belief (De Bruin, 2014).

Generally, false-belief tasks require the child to give a verbal response. This has been criticized as one of the perceived limitations of the standard tasks (De Bruin, 2014). In response to this potential limitation, other tasks have been developed to bypass the need for verbal responses and thereby make it applicable to younger children and even infants. Spontaneous-response false-belief tasks are an example of this. These tasks do not require verbal responses but rather rely on the child's spontaneous behavior for information. This research, for example, measures and tries to make meaning of a child who gazes for an extended period of time at something that violated their expectation. Meaning is also deduced from tasks in which a child casts a seemingly anticipatory gaze at the location where another person will mistakenly look for an object that has actually been moved.

An even more recent study suggests that false-belief tasks actually require a wide range of processing abilities any of which could make succeeding at the task difficult for a toddler (Setoh, Scott & Baillargeon, 2016). By reducing processing demands, 30- and 33-month-old children were more likely to succeed at the task (Setoh, Scott & Baillargeon, 2016). Young children's inhibitory processes, that is, their ability to inhibit certain responses, are still immature, and their ability to tune out their own privileged knowledge is limited and takes practice. The researchers argue that the standard task questions trigger "prepotent

responses" based on what the children themselves know (Setoh, Scott & Baillargeon, 2016). As children's inhibitory processes are limited, they do not suppress their initial responses when asked a standard task question about something they have some knowledge about. Despite the fact that this would otherwise be considered an unsuccessful task result, the child may well be able to express the knowledge of someone else if the processing demands were reduced. In other words, it is not that the child cannot express false-belief understanding, but rather that the child requires practice in expressing a response that conflicts with what the child herself knows. The researchers' solution was to allow the participants to practice engaging with the types of questions that would be asked in the test as well as the materials used. The researchers asked participants practice questions that resembled the ones they would be asked on the actual task. These practice trials were not opportunities to practice exercising false-belief understanding but rather to practice answering 'where' questions, choosing between two images presented, and anticipating when questions would be asked (i.e. when the researcher presented two images) (Setoh, Scott & Baillargeon, 2016). This procedure reduced the response-generation demands, and their results showed the effect. The majority of the 30 to 33-month-old participants succeeded at the task. Their results support the notion that theory of mind and false-belief understanding are both present in very young children: "there is substantial continuity in false-belief understanding from infancy to childhood" (Setoh, Scott & Baillargeon, 2016, p. 13361). By adjusting the administration of the task, it became more accessible to the young child.

2.2 Defining Theory of Mind

The term 'theory of mind' in an original sense refers to the basic human conception of mental states (Hughes & Leekam, 2004). When the term was coined and research into theory of mind became an area of intense inquiry, the methods that researchers used to try to identify theory of mind in children changed the way that we understood its existence. With the advent of false-belief tasks (e.g. Baron-Cohen et al., 1985), success on the task became akin to possession of theory of mind. Hughes and Leekam refer to this as the "narrow definition." This definition also narrowed the research to children over the age of three or four, hence the dearth in research of theory of mind in young toddlers who generally do not succeed on false-belief tasks before that age (Hughes & Leekam, 2004).

It also narrowed the definition of theory of mind to include only the child's representational understanding of the mind. This means that it excluded their understanding of mental states like intention and emotion (Hughes & Leekam, 2004). Meltzoff (2000) distinguishes between two levels of mental understanding. The first he calls "mentalism," which is the primary understanding that there are psychological states that operate under the surface of behavior. The second form is a representational model of the mind. As a "representationalist" the child understands that mental states are not simply replications of the world but rather unique interpretations of it depending on the individual. This mental state differentiation implies a sequential development of theory of mind in which certain stages or levels of understanding come to be determined by what precedes them. This, Meltzoff suggests, is the basis for the theory that a singular theory of mind may not necessarily exist. It defies the notion that theory of mind does not exist at one moment in development and then exists in the next, as if a light were switched on.

This also suggests that children younger than four or five might be incorporated into the population of children possessing a theory of mind. “The experimental data that exist seem to suggest that even two-and-a-half- to three-year-olds are mentalists, they read below the surface behavior to understand the actions of persons” (Meltzoff, 2000, p. 152). This is exemplified in research that displays young children’s usage of belief and desire to explain human behavior, i.e ‘they *want* to use this toy!’ (Meltzoff, 2000). This has been confirmed in three-year-olds (Bartsch and Wellman, 1989), and anyone who has spent time with two-and-a-half-year-olds knows that they too have the propensity, or at least the ability, to explain behavior in this way. This may be months or years before they might be able to succeed on a standard false-belief task. Perhaps there are several different “theories” or degrees of a theory that arise at different points in development as the child’s knowledge and understanding of the world evolve (Meltzoff, 2000). This is one possible explanation for the successful results of infants on tasks that do not require verbal explanations of mental states. Instead, these tasks seek to measure the child’s thought processes based on behavioral or mental indicators like gaze, joint attention, intention and sharing affective states (Stern, 1985). These are states that do not require language and that imply intersubjective awareness, that is, some kind of early interpersonal understanding of the mental states of others.

Young children’s abilities to recognize and respond to emotion are likewise an area of important inquiry and seem to precede conceptions of the mind, thought processes and therefore false-belief comprehension. Dunn (1991) suggests that it is probable that emotional awareness is more readily available earlier on than the ability to conceptualize other people’s cognitive processes. After all, young children, even infants, seem to be aware of other’s

emotions especially those close to them and are perhaps even empathetic to them (see: Gopnik, 2010).

A broader definition of theory of mind that includes insight beyond understanding of false belief expands the threshold of theory of mind to include younger children — a relatively novel demographic — and different degrees of awareness. In this way, a broader definition can allow for discrepancies between what a child can understand theoretically and what a child can actually perform in realtime. Based on her clinical work with people with autism[4], speech-language pathologist Michelle Garcia Winner has observed that what her clients can understand about social interactions on an intellectual or theoretical level is not necessarily reflective of how they could act in a situation requiring realtime social input (Winner, 2014). She calls this Slow and Fast Theory of Mind. Although Winner is referring specifically to her clients, this certainly points us towards a much broader picture of theory of mind with a definition that encompasses a complex range of mental and social insight.

Theoretical Perspectives

The ways in which researchers conceive of the roots of theory of mind are tightly bound to age and theories of development, and they are contingent on the definition of theory of mind that is being considered. What some might think of as origins of theory of mind, others might call contributors to theory of mind or the acquisition of theory of mind. This depends on the theoretical lens that is being used, that is, the actual structure of theory of mind that they believe in. Some lenses that are commonly applied include a modular point of

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[4] For the purposes and scope of the paper, theory of mind and autism specifically will not be discussed, although the research on the relationships between the two is invaluable.

view, a folk psychology point of view, and a simulation point of view (Origgi, 2015; Saracho, 2014b).

The modular or nativist point of view sees theory of mind as having an innate cognitive framework (Saracho, 2014b) as if it were a module or mechanism waiting to be activated (Origgi, 2015). This theoretical tradition suggests that theory of mind has an "innate basis" and is not learned or acquired (Saracho, 2014b). Seen in the light of a modular perspective, theory of mind develops independently of other social, emotional or cognitive developments (Origgi, 2015) and therefore places little emphasis on social and environmental factors (Hughes & Leekam, 2004).

On the other hand, some explain theory of mind as a folk or commonsense psychology. This theory relies on a common-sense understanding of how human beings behave to give behavior ordinary meaning (Michlmayer, 2002; Saracho, 2014b). Without scientific background, humans access theories of mind and behavior on their own, hence the use of the word 'folk' (Saracho, 2014b). Thus, seen through this lens, we are all folk psychologists. It is also a predecessor to the modern theory-theory (Saracho, 2014b) and explains the development of theory of mind as having a process similar to that of an evolving scientific theory. It begins as a "naive theory" that transforms and gets restructured with time, experience, and causal information (Origgi, 2015; Saracho, 2014b). Children are akin to scientists, using newfound data to inform their ever-evolving theories and conceptualizations of the world. This view takes into account the presence of other insightful abilities that children have, such as emotion recognition, desire and deception, before their ability to succeed on standard false-belief tasks (Origgi, 2015).

A third lens through which theory of mind can be viewed is through the simulation theory. Unlike the theory-theory, simulation theory suggests that mental insight depends not on a folk psychology but on an ability to simulate being 'in another person's shoes.' In other words, rather than an implicit common-sense understanding of human behavior, one has the ability to pretend or create comparable states as if one were another person (Saracho 2014b). It requires one to imagine themselves in another person's state and then extrapolate information based on what they imagine it would feel like to be that person (Michlmayer, 2002; Origgi, 2015). This is related to, and even otherwise known as, empathy (Matravers 2017; Michlmayr, 2002).

It is likely that we employ a combination of these theories in social interaction (Hodges and Myers, 2007). Furthermore, the operations utilized to recognize and interpret the internal states of others may change based on environmental factors or how much we know about the other person. This is true of both children and adults.

2.3 Functions of Theory of Mind

Before venturing to consider the potential acquisition or development of theory of mind, it is valuable to consider what the functions of possessing a theory of mind are at all. Why is theory of mind an important socio-cognitive ability and in what way does it have implications for our daily lives and in virtually all interpersonal situations? The short answer is that it implicitly underlies human communication and shared social realities. It is "essential for human interaction" (Saracho, 2014a, p. 6). The understanding of mental states, our own and therefore those of others, is what allows us to distill information out of other people's expressive behavior.

As will be discussed below, the information we distill can be descriptive, predictive or interpretive. For example, I can "predict" that if I filled a cereal box with rice, my friend would be confused upon opening it. In the reverse order, we can also interpret a meaning behind someone's body language, gestures, actions and facial expressions. If I see someone reaching across the table in the direction of the pepper, I can infer that this is what they are thinking about retrieving. I could be wrong, perhaps they are actually reaching for the butter that is right beside the pepper, but I can attribute a goal and a desire to them nonetheless. Both abilities are thanks to this insight into the connection between mental states and expressive behavior.

These seemingly banal examples are important to consider because they emphasize how often we might employ a theory of mind and how, for some people, it becomes as intuitive as breathing. These are situations that arise in the home, in the workplace, in restaurants, in a strategic game like chess, in the airport, between family members and between strangers, that is to say in virtually every social milieu. This interpersonal awareness

is not simply helpful: “Such insight is crucial to one’s well-being because it helps to make sense of what would otherwise be a very confusing social world” (Ruffman and Taumoepeau, 2014, p. 45).

The instances in which theory of mind can be and is employed are innumerable, but they can be categorized into three main functions — comprehension, prediction and manipulation — all of which require someone to, at the very least, conceive of another person’s perspective (Michlmayr, 2002).

Comprehension: At its most basic level, theory of mind is a tool that allows individuals to understand the behavior of others. It permits us to interpret daily behaviors by using mental states to explain those behaviors. It allows someone to understand what an individual’s goal is when she reaches into her bag and pulls a key out upon arriving at the door of her home or why a child cries when their ice cream falls to the ground. Simply put, theory of mind allows us to deduce why people do the things that they do.

Although empathy is not included in Michlmayr’s original classification of the functions of theory of mind, it seems to me that its absence from the conversation leaves a noticeable gap. Empathy is categorized into two types of responses that can be appropriately nestled in comprehension. Cognitive empathy refers to mental perspective-taking and the ability to perceive another’s thoughts, including their feelings (Hodges and Myers, 2007; Smith, 2006). Cognitive empathy affords us the ability to recognize thoughts and emotions in the first place. In doing so, we recognize that the internal states of others are not identical to our own. “Cognitive

empathy is intimately linked to the development of a theory of mind, that is, understanding that someone else's thoughts may differ from one's own" (Hodges and Myers, 2007, p. 297). Moreover, the ability to recognize internal states sets the stage for more complex interactions like interpretation, prediction, and manipulation, which will be discussed more fully below. All are preceded by the basic recognition of certain mental states, which cognitive empathy permits. On the other hand, affective empathy or emotional empathy refers to the "vicarious sharing of emotion" (Smith, 2006, p. 3). This encompasses emotional responses to others by way of empathic concern, distress and/or care. Exactly how these two empathic responses create the conditions for comprehension is debated, but it is clear that empathy and theory of mind are tightly intertwined.

Prediction: Predicting behavior is a more complex function of theory of mind and takes comprehension a bit further. The ability to anticipate behavior is part of what allows us to formulate proper responses to it thereby allowing a certain flow in human communication or interaction. We may not be aware of it, but we anticipate behavior regularly. I think it is safe to say that we have all uttered something along the lines of: 'I was not expecting them to say that' or 'I was caught off guard and didn't know how to respond.' However subliminally, we are constantly anticipating behavior from people based on our experiences in interpersonal situations, and we formulate our responses based on these expectations. When these expectations are defied, we are, as we say, 'caught off guard.'

Manipulation: The combination of interpretive and predictive abilities also allow individuals to use this mental-state intelligence to manipulate, persuade or generally influence behavior. Theory of mind can make information like another's desires, beliefs, intentions and goals accessible. If, for example, I wanted my roommate to take out the trash without explicitly saying so, I might predict that putting something very odorous in it would compel them to do just that. This requires the understanding that this person would not like the odor coming from the trash as well as the ability to predict that because they do not appreciate the odor, they will want to get rid of it. Hopefully, if I predicted correctly, they will take out the trash. In this way, theory of mind is directly responsible for the human ability to influence and control other people's behavior. Despite the modern connotations of 'manipulative' behavior, this function of theory of mind is neither inherently malevolent or benevolent, rather powerful.

Taken together, these functions of theory of mind are clearly essential in social situations that are not explicitly narrated. Take the example of the key again: one would not necessarily say 'I am reaching into my bag to get my house key, so that I can put it into the key hole to unlock the door, so that I can get into my house.' This is indeed the thread of intentions that underlie each action in this particular situation, but they are all implicit. Theory of mind permits unspoken yet mutual understanding.

It is important to note that theory of mind can have socially positive, negative and/or neutral influences (Hughes & Leekam, 2004). In older children, insight into mental states can have both positive and negative social outcomes such as enhanced connectedness and

capacity for communication as well as forms of bullying that require a certain level of insight (Hughes & Leekam, 2004). For example, like manipulation, theory of mind is integral to the ability to lie. Lying, despite any qualifiers we might attach to it, requires a fairly advanced understanding of the difference between reality and an intentional misrepresentation of it that will likely mislead another person. The key to understanding theory of mind in the context of lying is not how successfully a child can manipulate reality. We know from their pretend play very early on in life that they are quite capable of doing this. What is important is that the child has manipulated reality in such a tailored way that they expect their lie to be convincing to another person with another mind (Frye & Moore, 1991).

Likewise, pro- and antisocial behaviors can also promote theory of mind themselves. As the ability to conceive of another's perspective is instrumental in both pro- and antisocial interaction so can pro- and antisocial behaviors contribute to the development of theory of mind: "both empathy and malicious teasing are associated with age-related increases in toddler's awareness of internal states" (Hughes & Leekam, 2004, p. 607).

Theory of mind is a helpful tool used to decipher the world in which we live. As adults, we may take this understanding for granted; we may not even be aware of its presence in our daily lives. For toddlers, it is less clear how available this awareness is. The interpersonal behavior of children seems to suggest that, in general, young children's social intelligence differs from that of older children and adults. The idea that young children seem less likely, or less able, to conceive of perspectives other than their own and thus adjust their behavior accordingly, suggests that there is something to be developed, nurtured, facilitated or acquired that ultimately underlies all social interaction and interpersonal understanding. It is an exploration into the unseen, inner workings of basic human sociability.

2.4 Roots of Theory of Mind

Given the age at which children begin to comprehend and succeed at standard false-belief tasks, the historically accepted view was that a coherent theory of mind emerged in four to five year old children (see: Astington, 1991; De Bruin, 2014; Saracho, 2014a). Suggestions about the earliest signs of theory of mind in infancy point to a variety of domains within cognitive and social development. "Some show that an understanding of mental states is innate" (Saracho, 2014a, p. 9), that the beginning of an infant's life marks the beginning of its development and that some basic interpersonal understanding is implicit. Some cross-cultural research takes an evolutionary stance and points to the potential adaptive qualities of false-belief understanding that emerge early on in development as a form of psychological reasoning (Barrett, et al., 2013).

Indeed, the dominant view in the literature on theory of mind is that infants have the ability to comprehend mental states (Ruffman and Taumoepeau, 2014). However, the assessment procedures and results used to support this belief can be interpreted differently. Some researchers argue that early "signs" of theory of mind or perspective sharing could just as easily be interpreted as pattern and behavior recognition (Ruffman and Taumoepeau, 2014). Conversely, developmental psychologists who are convinced of this ability in infants claim that non-verbal activities like imitation and sharing affect are examples of the infant capacity to understand mental states (Gopnik, 2010).

Imitation

Imitation in infancy is often regarded as grounding evidence for mental awareness. Some go so far as to suggest that it is the basis of infant empathic predispositions: "…for

babies imitation is both a symptom of innate empathy and a tool to extend and elaborate that empathy" (Gopnik, 2010, p. 206). Although imitation is also criticized as rote mimicry, some research provides contrasting evidence that imitation and observational learning may contribute in some way to a child's developing understanding of "shared meaning" (Hay et al., 1991). A study by Hay, Stimson & Castle suggests that behavioral imitation is mutually meaningful for the child and the person (adult) that he is imitating. Not only is it mutually meaningful, but imitation is also inseparable from the intentions and desires of both the child and the adult (Hay et al., 1991). Moreover, this awareness of shared meaning is promoted by opportunities to imitate and learn observationally. Although their study could not define direct consequences on the construction of theory of mind specifically, it illuminates a "meeting of minds in the conative realm between thought, feeling and action" (Hay et al., 1991, p. 136).

Intentionality

Another domain that has been suggested as evidence for infant theory of mind that may precede false-belief comprehension is intentionality (Meltzoff, 2000). It is clear that infants share in emotional states and are able to recognize behavioral patterns fairly early on in life (Dunn, 1991), but the connection between these abilities and a more complex insight into mental states is less clear. Recognizing behavior as intentional is regarded as an important milestone in laying the groundwork for a child's social development (Hughes & Leekam, 2004). Thus intention in infancy is one area of development that has been strongly linked with the development of theory of mind (Frye, 1991; Meltzoff, 2000). Indeed some define theory of mind as the ability to understand others as "intentional agents" (Origgi,

2015). Frye's argument for this relationship stems from the notion that recognizing intention seems to demand more insight than simply recognizing behavioral patterns and thus is a prerequisite for theory of mind (Frye, 1991). He suggests that this occurs around the time that a child is eight months old, when social and cognitive abilities begin to become differentiated. This crucial differentiation refers to the child's budding ability to distinguish people from objects and the different behaviors that each of them evoke - biological or mechanical. Piaget recognized similar behavior in his work on children's conceptions of the spatial and social realms.

As adults, we know that one must act differently toward a person versus an object, but research and observation show that this is not immediately understood. Frye found that while ten-month-old babies made this behavioral distinction, three-month-old babies did not. Piaget made a similar observation of changes in children's experiences of the world during the *sensorimotor period* (Doyle, 1987). The children that he observed to be making this differentiation were roughly the same age as the children that Frye observed. Piaget called this fundamental shift in experience the *Copernican Revolution,* during which children's knowledge about the social and physical worlds and their relationships to those realms evolves (Doyle, 1987). The direct implications for children's abilities to understand other perspectives derive from this differentiation of the spatial and social worlds itself because taking another's perspective requires social knowledge that cannot be explained by the laws of the physical world. Frye suggests that perhaps it is intention that permits this eventual qualitative differentiation in behavior (Frye, 1991) because intention implies a mental existence that informs future behavior. What is less clear is how much an infant's understanding of their own intentions towards objects and people determines their

understanding of these same tendencies in others and, importantly, *not* in objects (Frye, 1991). Nevertheless, their awareness of their own intentions at least offers a chance to recognize them in others (Frye, 1991). It is a watershed moment when the child is able to conceive of others as 'selves' (Bretherton, 1991).

Meltzoff (2000) would agree that intention is a likely spring from which theory of mind flows. His findings show that at eighteen months this essential differentiation between person and object seems to exist (Meltzoff, 2000). This is in line with both Piaget and Frye's prior findings. Children seem to be able to infer intention from the actions of a human being specifically but do not always attribute the same intention to an inanimate device even when it mimicked the action of a human being (Meltzoff, 2000). Perhaps there are "limits of the types of entities that are interpreted within this framework" (Meltzoff, 2000, p. 165). In other words, it seems that at eighteen months babies reserve attributions of intention exclusively for people. This could be the foundation for a "theory of mind module" (Meltzoff, 2000) — a tendency to engage with human beings within a different framework than that within which we engage with objects.

If evidence of theory of mind springs from behaviors in infancy, then what are the subsequent agents of its development? According to research, these agents are parts of the social domains of a child's life. In these domains, the child is exposed to the reality of other minds and, later, has the opportunity to discuss them. The following section discusses some of these potential agents of development.

2.5 A Developing Theory of Mind

However the roots of theory of mind are conceptualized, it is clear that mental insight evolves over time and with experience. Research has shown that many, if not most, of the significant experiences that cultivate theory of mind seem to be, perhaps not surprisingly, very social in nature. Again, the roles that different social elements play in this development are reported differently in the literature. There are theories that place varying weight on the roles of attachment, social interaction within family systems, language and play.

Attachment

Generations of research in attachment theory emphasize the importance of a caregiver[5]-child relationship and secure attachment in virtually all areas of a child's development. Socio-cognitive development is no exception. The links between theory of mind and caregiver sensitivity and emotional availability have been a telling area of recent inquiry (Licata et al., 2016). The direct consequences of the caregiver-child relationship on theory of mind are quite clear. These researchers argue that caretaker sensitivity is instrumental in bolstering the child's ability to recognize and interpret mental and emotional states (Licata et al., 2016). Moreover, research has reported a direct lineage from maternal sensitivity, warmth and secure attachment to the child's theory of mind later in life (Licata et al., 2016).

Social-emotional and socio-cognitive development are enhanced by a strongly sensitive and emotionally available caretaker (Licata et al., 2016; Hughes & Leekam, 2004).

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[5] Indeed, the role of 'caregiver' has historically been synonymous with the mother, but the word caregiver will be used in this discussion to represent primary caretakers that certainly include but are not limited to the mother.

The social, emotional and cognitive abilities later in life that are linked to earlier attachment and caregiver sensitivity include emotion recognition, false-belief comprehension, understanding goals and intentions, and empathy (Licata et al., 2016). Therefore, although the amount of research in this specific domain is not significant, the importance of the attachment relationship to the development of theory of mind is strongly emphasized by some (see: Hughes & Leekam, 2004). The evidence for these assumptions derives from the reported outcomes of an emotionally consistent and engaged caretaker. Licata et al. (2016) argue that the emotional availability of the caretaker affords the child three significant things: (1) Acknowledgment by way of the mother's reflection of the child's own mental states; (2) Consistency between the mother's affect and the actual emotions that underlie it, thus allowing the child to correctly connect behavior with mental states; (3) Freedom to revel in the security of a stable and consistent caretaker and thereby have the emotional capacity to focus on others.

These findings, however, are punctuated by the child's own characteristics. The relationship between a child's temperament and their own attachment to their caregiver is also significant. That is to say that taking temperament into account as well as its implications on the quality of their early attachment could explain individual differences in the age at which children understand false belief (Licata et al., 2016). While it has been reported that a mother's sensitive and warm interactions towards her baby have influence on the later development of theory of mind, what needs more research is the extent to which the mutuality of their relationship affects the developing insight. This mutuality is defined by a connection consisting of both the mother's *and* the baby's demeanor and interactions. Given how enmeshed the emotional sensitivity of the mother usually is in the child's own emotional

feedback, this group of researchers expected and reported a correlative relationship between the emotional availability of the *child* and their own development of theory of mind. The emotional connection was beneficial to the child's mental-state understanding (Licata et al., 2016). The findings suggest that although the caregiver's warmth and sensitivity is valuable and necessary, the better indicator in later developments in theory of mind is the dyadic connection between caregiver and child. Moreover, early interaction proved to be more significant than later interaction in the development of social cognition, serving as the bedrock of theory of mind.

Family Systems

Theory of mind is ultimately a social matter. It follows, then, that its development might be most significantly fostered in social modes. Observations of children in families make evident how in tune young children are to others, particularly within their close family systems (Dunn, 1991; Licata et al., 2016; Perner, Ruffman & Leekam, 1994). Dunn and others shed light on an inconsistency in the theory that young children are limited in their understanding of others given their overwhelming ability to function within the social ecology of a family (Dunn, 1991). Likewise, the family system itself plays an important role in the development of mental insight (Hughes & Leekam, 2004; Perner, Ruffman & Leekam, 1994). A large family and particularly one with siblings has been positively correlated with false-belief understanding in three to four year olds (Perner, Ruffman & Leekam, 1994). Together, these statements suggest that children have more interpersonal insight at a younger age and that the social environment plays a decisive role in the development of this insight. It is a two-way street.

Given Dunn's observations, it is clear that two-year-olds recognize and respond to the emotional states of family members. The second and third years of life are particularly generative in terms of acquiring insight into feeling states and intentions (Dunn, 1991). Not only do they recognize emotion states, namely distress, but they also seem to be curious about the causes of those emotions (Dunn, 1991). Dunn also suggests considering the role of familiarity of person and context in a child's ability to understand a person's mental state. Perhaps there are different degrees of awareness for intimate family members versus hypothetical others that usually dominate research of false-belief comprehension. How much do children, or even adults, need to know about a person before they can truly attribute mental states to them? Among other variables, Dunn proposes that the emotional context of the family and the events that occur within them, such as disputes and family discourse about others, might contribute to developing theories of mind.

Social systems like the nuclear family both nurture theory of mind and provide opportunities for children to employ it. The familial context is particularly important to consider given the emotional investment of the child in it. Studies show just how invested children are in matters, namely disputes, that are particularly relevant to them (Dunn, 1991). This research highlights the relationship between emotionally-charged exchanges and social intelligence. Results showed that situations of arousal did not seem to be incompatible with children's learning. On the contrary, these emotions seemed to contribute somehow as children appeared to exhibit their most "mature" social behavior in disputes over their own rights and interests (Dunn, 1991). Indeed, in disagreement social intelligence becomes an increasingly important skill.

> [T]here may well be special significance in the emotion-laden exchanges in the family — exchanges in which it is clearly of great importance for the child to learn how others will behave and think. (Dunn, 1991, p. 111)

Disputes with others inherently involve the diverging interests of at least two people, creating potential opportunities for the child to be exposed to differing points of view. Moreover, the fact that these situations are emotionally salient to the child might mean that they will be more likely to apply their intelligence (Dunn, 1991). Generally, for young children these kinds of interactions occur most often in the home and between intimate family members.

Cooperative situations between older and younger siblings are also formative moments and are positively correlated with false belief understanding in younger siblings (Dunn, 1991). Thus, these moments of conflict and cooperation prove to be crucial in the child's developing understanding of other people. Not only are they forced to grapple with the opinions of others as distinct from or even as similar to their own, but also this usually entails some explicit discourse about opinion, intention, desire and belief. Thus, family discourse about the intentions of others is also potentially significant to a developing theory of mind (Dunn, 1991). Dunn suggests that these kinds of conversations that distinguish the mental states of one person from another support the child's own developing theory of mind longitudinally.

Likewise, Dunn's observations of jokes and shared humorous experiences as well as moments of teasing suggest a sensitivity on the part of the young child to others' mental states. Humorous exchanges suggest that a child must have some idea of what the other person will find funny, and 'successful' sibling teasing requires the young child to predict what would rile their sibling up.

Although theory of mind is often regarded as congruent with age and maturation, a theory that emphasizes the child's environment and social systems adjusts the emphasis. Instead, emphasis is placed on social and environmental factors, like family size and cultural and familial background, as responsible for the rate at which theory of mind develops and evolves. This approach also highlights the child's own effects on their environment and the significance of the interactive role a child plays in their own development (Hughes & Leekam, 2004).

Language

Like the exchanges between a child and their environment, the relationship between a child and their budding linguistic capabilities is seen as a significantly formative one. Among other social and cognitive variables that have been explored, language emerges as having one of the most significant relationships to theory of mind and false-belief comprehension. For children, language bears weight on the complexity of their mental insight (Saracho, 2014a; Milligan et al., 2007). Not that insight into mental states exists only in the company of acquired language, but rather language affords perspective sharing the potential to reach more complex levels (Milligan et al., 2007). With the acquisition of language comes a more complex way of categorizing and describing phenomena, namely mental ones. As individuals mature, insight into our own and therefore others' emotional states, desires, opinions and beliefs will be attached to and expressed with words (Saracho, 2014a). Importantly, these words may or may not be verbalized but they are words nonetheless (Saracho, 2014a). They are common symbols that contribute to mutual understanding and to the ability to communicate effectively with other people. Indeed the general consensus is that language

and theory of mind are interactive. However while both have a hand in the other's development, language seems to have a stronger influence over the development of theory of mind than the reverse (Milligan et al., 2007).

With that said, these findings can be interpreted quite differently. Some argue that language is correlated with theory of mind because it affords the child certain receptive and expressive capabilities that allow them to understand the words that they hear and to describe what they are thinking. Consequently, this has been one of the major arguments for language as a barrier to the successful distillation of information from false-belief tasks with young children (Meltzoff, 2000). This, however, implies that false-belief tasks are effectively verbal tasks and may be a misleading way to evaluate theory of mind (Milligan et al., 2007). As the acquisition of language often occurs steadily alongside age, it has been used to indicate the point at which a child will be successful on a false-belief task and thus possess a coherent theory of mind. Other studies propose that age might not necessarily be a determining factor given some inconsistencies in age and success on the task. In reality, children have been known to succeed at false-belief tasks at three, or in the case of this thesis 2 years 11 months, or for the first time at five (Milligan et al., 2007).

On the other hand, some believe that the properties of linguistics are not significant and that language is indicative of certain conceptual developments in consciousness. In their meta-analysis of 104 studies evaluating the correlation between language and false-belief understanding, Milligan et al. (2007) propose that an understanding of false belief is undeniably connected to language but is not consistently dependent on the same linguistic abilities. This is evidenced by inconsistent results from studies emphasizing the relationships between specific linguistic areas, like vocabulary, semantics or syntax, and false-belief

comprehension (Milligan et al., 2007). As the findings were varied and contradictory across studies, it is unclear how requisite mastery of certain linguistic systems actually are for the development of theory of mind or false-belief comprehension.

What seems to be a more relevant explanation for the relationship between language and theory of mind is how linguistic capabilities are indicative of conceptual capabilities. As language develops so does familiarity with "mental terms" like "think," "believe" and "remember." As these terms are imbued with meaning, it permits a growing conceptual understanding of the representational lives of human beings and the ability to socially interact based on this understanding (Milligan et al., 2007). This goes beyond pure linguistic ability because the child must be able to use terms that describe mental positions meaningfully (Milligan et al., 2007). Thus, this is indicative of a conceptual *and* linguistic shift that takes place sometime in the preschool-age years (Milligan, et al., 2007). It is not enough for the child to be able to say the word "think" — a feat of vocabulary — for they must also know that when they use this word, they are recognizing and evoking unseen mental processes that govern what people say and do.

Play

Play is another domain in which theory of mind skills and false-belief comprehension develop. There is plenty of convincing research and theory that proves the multifaceted value of play in the lives of children. These studies suggest that play promotes a variety of developmental domains such as language development, literacy, social skills, meaning making, social-emotional development, emotion-regulation, impulse control, motor skills, creativity, other cognitive functions and learning in general. Theory of mind and false-belief

comprehension are certainly part of this and theorists from different theoretical backgrounds consider pretense to be a precondition for false belief.

Pretend play affords children direct experiences with pretense and role play that seem to invoke the same skills used in understanding mental states (Lillard, 1993). Ultimately, Lillard's study concluded that although children's behavior in play might *seem* to indicate that they are aware of the mental basis of pretend realities, there was not enough evidence to support it. It is possible that in pretend play, children can understand how to play "as if" they were someone or something else without recognizing the fact that those alternate existences are based in mental realities (Lillard, 1993). Nevertheless, "as if" play is a noteworthy part of the process towards false-belief understanding in particular. "Belief and pretense are conceptually very closely related because both lead to acting-as-if" (Perner, Ruffman & Leekam, 1994, p. 1236). Veena Das also alludes to this significance and intersection of conceptual skills:

> The significance of play lies in the fact that it enables the child to take the voice of the other. It is when the child learns to assume the viewpoint of other people through role playing. (Das, 1989, p. 280)

Pretend play in particular is a prime example of how a child must be able to accommodate multiple realities simultaneously — both the real and the pretend (Vygotsky, 1978). Theory of mind requires a similar flexibility in thinking (Sussman, 2012). This seems especially applicable to false-belief, as it also requires the accommodation of multiple realities, that is, the diverging realities of the self and the other.

Perhaps the most relevant areas of development that play promotes are socially oriented. Like interactions with siblings and other family members, pretend play with other

children provides opportunities for them to agree and/or disagree and thereby reconcile the existence of different perspectives. Play encourages children to consider other points of views and to negotiate them (Sussman, 2012). Play with other children functions much like interactions within the familial context because it naturally requires children to interact with people that have distinct mental lives governing their behaviors, desires, and emotions. Like play with siblings, play with other children is an example of a cooperative activity and perhaps one of the most intensive social situations that toddlers are exposed to (Perner, Ruffman & Leekam, 1994).

Play, like attachment, family systems and language, is important to consider because it is an example of a domain in which theory of mind is both employed and cultivated. It is a genuine example of the child's active and participatory role in a creative context that is exceedingly specific and important to children. Indeed, "pretend play is perhaps our best candidate for a cooperative activity which furthers the eventual understanding of false belief" (Perner, Ruffman & Leekam, 1994, p. 1236)

3. False Belief Task and Naturalistic Observations

3.1 Methods

In light of the preceding sections, the following chapter presents an authentic false-belief task. It is in part a nod to research that questions the potentially decisive role of language in tasks like these, as well as to the significance of this watershed moment in the development of theory of mind. Additionally, naturalistic observations of these children in the same setting offer different interpretations of their awareness and perspective-taking abilities despite or perhaps in complement to their task results. Thus, in order to encompass more comprehensibly the range of engagement with mental states in the classroom, the following study is comprised of these two distinct parts. Together, they ultimately create a more holistic image of theory of mind and false-belief comprehension in this group of two-and-a-half-year-olds.

Table 1: Children's Ages - Afternoon Two's Class

Child	Age (In Years:Months at time of task)
Child 1	2:6
Child 2	2:9
Child 3	2:11
Child 4	2:6
Child 5	2:7
Child 6	2:11
Child 7	3:0

False-Belief Task

The task that I carried out was an adaptation of a standard false-belief task. While this task is generally reserved for older children, I simplified the language and adapted the procedures in an attempt to make it more relevant to the two-and-a-half-year-old child. A standard false belief task requires a child to consider the perspective of a late-arriving bystander. This bystander enters a situation in which the child has privileged knowledge about something that will ultimately defy the bystander's expectation. In this case, I used a bandaid box filled with rocks. Before seeing the alternative contents (i.e. rocks), one would likely assume that the band-aid box was filled with bandaids, thus creating a false belief or defied expectation.

The group of participants was originally comprised of all eight children in the afternoon Two's program[6] at the Early Childhood Center (see Table 1 for ages). Although at the beginning of this study there were eight participants, for a variety of reasons, one child was no longer able to participate in the task and therefore the final number of participants is seven. All seven children participated voluntarily, and no one was forced to participate.

The first step of the task was to obtain oral consent. Upon obtaining oral consent from each child, the first questions I posed confirmed that the child indeed knew what bandaids

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[6] Given the uniqueness of this particular program, a brief description of it will be contextually beneficial to the reader who is not familiar with it. The purpose of this particular Two's Program is to invite children and their parents to experience school together for the first time and to facilitate healthy parent-child separation at a pivotal moment in the child's development. The geographical space is divided into the "classroom" and the "parent room." At the beginning of the year, both parent and child are in the classroom together until they are ready for the parent to move into the "parent room" down the hall. The children are able to move freely between rooms and interact with their parents on their own terms whenever they need or desire to. Naturally, the needs of the children fluctuate daily and generally over the course of the year, and there is great variation in how much children flow between the rooms. Some children do not leave the classroom for the duration of class and others flow between the rooms consistently.

and the bandaid box were. Then I asked them what they thought was inside of the box. I had loose bandaids to show the child and to ignite a bit of conversation about them. After the child's statement about what they believed to be inside the box, I opened the box to reveal that it was, surprisingly, filled with rocks instead of bandaids. Then, I asked the child what was *actually* inside the box to confirm their knowledge of both rocks and the actual contents of the bandaid box. Finally, I closed the box and asked the child what I will call the "pivotal question," that is, what they thought one of their late-arriving classmates would think was in the box given the fact that they had not seen the whole demonstration (e.g. Now, there's Sally over there; what is Sally going to think is in the box?). I also presented an image of the late-arriving classmate while asking the pivotal question in order to provide more visual context for the participant. The choice to invoke a classmate versus a hypothetical other was intentional given Dunn's suggestion that familiarity might play a part in the ability to attribute mental states. Parents were considered to fulfill this role but were ultimately not utilized out of concern that the emotional tie to the parent, or perception of parent as all-knowing, would somehow muddy the responses.

In an attempt to account for the variation in linguistic ability, I offered two images for the child to point to in response to the pivotal question — one of a box of bandaids filled with bandaids and the other of a box of bandaids filled with rocks. The idea was for the child to have the option to either point to an image or to express their thoughts verbally. After hearing or seeing their prediction of the late-arriving bystander's perspective, I asked the child why they thought what they did in order to get a better sense of the mental operations that led them to their answer.

Each interaction lasted a few minutes and children were free to refuse to respond or ignore me if they wished to. Children's real names were not used, nor was the information recorded indicative of any individual children by name. Responses were recorded directly after each individual task and after the child had returned to another classroom activity.

Naturalistic Observations

The purpose of including naturalistic observations in addition to a false-belief task is multifold. Although I attempted to adapt the task to be more accessible to a child under the age of three, I did not assume that it would be foolproof and thus I included descriptions of quotidian interactions that occurred in the classroom.

My observations focused on any episode of the children's interpersonal interactions, attributions of mental and physical states to other people or fictional characters (i.e. dolls and characters in books), and instances that might signify a conception of false belief. These observations included attributions of desires, beliefs and/or opinions that either did or did not diverge from the child's own, moments of deception, and shared humor. I also observed numerous instances of inquiry into children's intentions (e.g. 'Why is she doing that?') and moments of deception (e.g. 'I am going to hide this here so that he won't find it!'), as well as sympathetic tendencies, empathetic behavior and intersubjective understanding between peers. These latter behaviors were exemplified by children's reactions to and awareness of other children's emotions (i.e. sadness, pain and frustration). Most of these instances occurred in moments of emotional distress, harking back to Dunn's suggestion that children of this age become increasingly sensitive to these kinds of emotions. In these situations, I also made note of the mental or behavioral terms that the children used to describe each

other, for example ‘the child is crying’ versus ‘the child is sad.’ The difference in qualifiers that children choose shows just how varied the attributions are that young children are making to other people.

Observations took place twice a week for two hours each in the same afternoon Two’s class. The eight children ranged between the ages of 24-36 months over the course of the academic year (September 2017 — May 2018). Two initially significant variables — age and setting — made this group especially fascinating given the novelty of the social situation and the children’s varying linguistic levels. Most of these children were experiencing school and socializing in a group of numerous children for the first time, and language, an important tool in relaying experiences, beliefs and desires to others, was vastly diverse among the eight children.

3.2 Results and Discussion

False-Belief Task

Table 2: Children's Responses to the Pivotal Question

Child	Response to the Pivotal Question
Child 1	n/a
Child 2	Rocks
Child 3	Rocks
Child 4	n/a
Child 5	Rocks
Child 6	Bandaids
Child 7	Rocks

More than half of the children in the study answered incorrectly (rocks), one child answered correctly (bandaids), and two of the children were unable to complete the task in its entirety for varying reasons. Although the purpose of conducting this study in the classroom and choosing classmates to be the late-arriving bystanders was to provide some familiar framework, this did not seem to me to make the children more likely to correctly attribute false belief. Moreover, I found the images to be a distraction rather than a helpful aid. In light of the research by Setoh, Scott & Baillargeon (2016) the images might have been better incorporated into the task by allowing the children to practice using them before the actual task. Although the children liked looking at them, it seems that it was necessary to introduce how I intended for them to be used. The majority of the children had enough language to verbally express their thoughts, thus interaction with the images usually dissolved into labeling of the objects in them.

The children's results could exemplify several things depending on the theoretical lens applied. The results could be typical of children whose theory of mind has not yet reached the level of false-belief comprehension or whose linguistic abilities created limitations surrounding the language and/or conceptual understanding of the task. From a processing-demands perspective, the task may not have reduced the demands of the task enough and thus the child's inhibitory limitations interfered with their ability to answer correctly. As we have gathered from the literature, there is great variability in theoretical explanations as well as in general in children's lives. Therefore, the same explanation may not be applicable to all six children that did not succeed on the task. For some children language did indeed seem to be a convincing barrier, for others it was attention. For others still the barrier seemed to be conceptual as was the nature of the context in which false-belief comprehension was being invoked. In other words, perhaps access to false-belief understanding fluctuates depending on the context, which in this case was either a contrived task or a spontaneous, observed play scenario.

For the purpose of discussion, I have chosen to focus on four of the seven children. The choice to include these four was based on how their task results exemplify certain phenomena that have been previously discussed or how the circumstances of their task defied my own expectations.

Child 1, 2:6

This child could not participate for the full length of the task due to external distractions, such as other activities and toys. I attempted the task twice with this child, and both times was only able to get through the first part of it, that is, before asking the pivotal

question. This child also has the least amount of language of all the students. His language consists mostly of one- or two-word statements. During the first attempt, the child simply walked away after seeing what was inside the box. When he came back, I proceeded to ask him the question using the visual aids. He pointed immediately to the image of the box of bandaids filled with bandaids and then immediately afterwards to the image of the box filled with rocks and said "rocks." My interpretation of this is that this child pointed to the box filled with bandaids out of recognition and then pointed at the rocks for the same reason but was simply connecting the word 'rocks' to the image of rocks.

During the second trial, the child wanted to see what was inside the box immediately, and when I began to ask the pivotal question, the child pointed at the closed box and said "bandaids" then got distracted by a basket of cars nearby and walked away. My interpretation of both of our interactions together is that this child was likely naming recognizable objects and that his attention was divided. This might have been expected, however, in a classroom filled with other tantalizing things that are certainly competition for attention.

Child 4, 2:6

This child agreed to answer some questions about the bandaid box, but as soon as I started to ask about them, the child became very anxious and kept repeating: "no boo boos; I don't have any booboos." I tried to clarify to him that I was aware that he did not have any injuries and that the bandaids were just for fun, but he could not let go of the expectations linked to the sight of bandaids. This was not a barrier that I anticipated running into, but is helpful to note for future research. It is an example of a child's potential inability to separate an object from a very specific meaning or experience and the emotionally-charged fog that

can cloud one's ability to attend to a task. It is not surprising that this was a reaction to bandaids, as they are usually employed when the child is injured and is potentially distressed. Perhaps I was not clear enough about the fact that I was not assuming the child had an injury, but it seemed that as soon as he saw the bandaids, his mind was set on rejecting them. In the future, I would offer another set of materials as an option for a child who is uncomfortable engaging with bandaids.

Child 5, 2:7

Child 5 represents the majority of children that answered "rocks." This child thoroughly enjoyed the task and was very interested in playing with the bandaids, namely opening them and taking them out of the encasing. This child enthusiastically answered by saying "rocks" after being posed the pivotal question. When I asked this child why she thought this, she responded "because it's silly!"

This response can be interpreted several different ways. The word 'silly' is the same one that I used when describing the "silliness" of the bandaid box filled with rocks. From a linguistic point of view, the child could have simply misunderstood the language and used my qualification about the box full of rocks to explain the other classmate's hypothetical reasoning. Other, cognitive interpretations of this are possible. If in fact the child does not yet have a theory of mind that would allow her to conceive of another's perspective, then it could be argued that this child still attributes her own view of the world to others. Piaget would have described these results in terms of egocentrism. The children who answered rocks said so because at this time in their lives children attribute their experience of the world to everyone else. The children's follow up responses might also support this notion, such as the

responses of Children 3 and 4. Their reasonings were, “because he knows there are rocks in there” and “because he likes them” respectively. Both of these responses could be seen as deriving from the children’s own knowledge and feelings about the rocks in the box.

Child 6, 2:11

After being posed the pivotal question about the knowledge of the late-arriving bystander, this child answered confidently and enthusiastically, “band-aids!” Although it was not part of my task, she insisted that we show the late-arriving classmate the contents of the box to witness the reaction. When we did, the classmate reacted with excitement and Child 6 rejoiced in the fact that the bystander’s expectation had been defied. This is impressive given the literature that suggests that this task is only successful with children over a certain age. It was especially interesting given the fact that at the end of the task she insisted on following through with the hypothetical situation to experience the classmate’s reaction. The other children in the study returned to play when the task had been completed.

Moreover, this child’s unique capacity for play that involves pretense and role-taking further validates her result with evidence of her perspective-taking abilities outside the domain of this task. As we have seen, there are several reasons why role-taking in play is a fascinating phenomenon. The reason that it is so relevant to theory of mind and to this child is that it clearly exemplifies her ability and propensity to conceive of, and even to actively embody, another person’s perspective.

Child 7, 3:0

This child's response to the pivotal question was "rocks," although I hypothesized that this child would answer correctly given his age and linguistic capability. When I asked him why he thought this, his responses seemed to evade the heart of my question: "I'm going to take [the rocks] out to show [her]. I'm going to take them out and line them up so that [she] and me can count them together." Then, he began to take the rocks out of the box one by one and line them up on the floor in a long column. Any further inquiry from me was effectively ignored.

Children 6 and 7 are the two most advanced speakers in the class. While I do not know much about their home lives firsthand, I know that they are both only children and spend much of their time out of school with their mothers. I can assume from their interactions with their parents at school that the children are viewed as partners in conversation and in play with at least their mothers. Although I hypothesized that both would succeed on the false-belief task based on their abilities in other areas, only Child 6 did. Child 6 is a few days younger, does not usually leave the room to play with her mother during class and occasionally engages with other children. She usually plays alone, but is not ruffled by the unsolicited curiosity of other two-year-olds. On the other hand, Child 7 is consistently removed from the group and makes clear that he wishes to be removed by choosing secluded places to play. He is possessive of toys and often wishes to leave the room to play with his mother — his preferred playmate. Given Child 6 and 7's similarly advanced language skills, linguistic ability cannot account for their differing task results. Although I might have agreed with the theory that standard false-belief tasks might actually be more evaluative of linguistic abilities than cognitive ones, after conducting research of my own and looking at the results

from two children of almost the same age with similar linguistic capabilities, I am not so sure. Language is certainly part of it, but exactly how is less clear, and these two task results make this evident.

Naturalistic Observations

Observation A

Participants: Child 2 (2:5), Teacher

> Child 2, who has taken to playing with baby dolls, pulls one out of the crib.
>
> Child 2: "Is the baby hungry?" He brings the baby to the teacher and asks her if the baby is hungry.
>
> Teacher: "You want to know if the baby is hungry?"
>
> Child 2: "Yes."
>
> He moves away and begins feeding the baby. He lines up several babies on the table and hovers over one of the babies with a toy bottle, feeding it.
>
> Child 2: "Their tummies rumble." He repeats this to himself several times.

In this observation, Child 2 attributes a mental state — hunger — to a physical indicator — rumbling tummies. What we do not know, however, is what operation the child is employing to make this claim. Is it a function of theory of mind? While the answer is decidedly ambiguous without more comprehensive insight into this child's thought processes, the child is making behavioral inferences.

As Piaget originally suggested, there can be a way of inferencing that is egocentric. The narrative connected to this is something along the lines of 'How would I feel if I myself

were in this situation?' This is a generally familiar narrative even for adults. In this case, self-insight helps inform the insight that we have into the mind and behavior of another person. This is not to be confused with a similar but different narrative: 'How would I feel if I *were* that person,' which is what a simulation theory suggests. In this case, instead of using self-knowledge to gather information about others, knowledge about the other is directly employed. In light of this, it is possible that this child is using his own knowledge from past experiences with hunger. Making a claim about the baby with the rumbling tummy would be based on how he himself would feel if his own tummy were rumbling. Apparently, he would feel hungry.

This same operational pattern is evident in his attribution of feeling states to characters in books that we read. He consistently comments on a certain smiling butterfly at the end of Bornstein's *Little Gorilla* (2014): "The butterfly is smiling because everyone is singing "Happy Birthday"!" Then the child points to the smirking gorilla beside the butterfly: "He's happy too." Child 2 attributes happiness to the butterfly and the gorilla because they are smiling and because they are being serenaded by their friends on their birthday. We can infer from his claims that he believes that people feel happy when others sing "Happy Birthday" to them and that smiling indicates happiness.

Whether this information derives from his own personal experience or whether he is using the behavior of smiling as an indication that the animals are enjoying themselves is, again, ambiguous. Yet, despite the operation used to make inferences about the 'internal state' of the baby doll or the butterfly, he is making a connection between an observable behavior and attributing it to an unseen feeling state. This could be reason enough to believe that though he many not yet understand false belief, he understands that mental states underlie

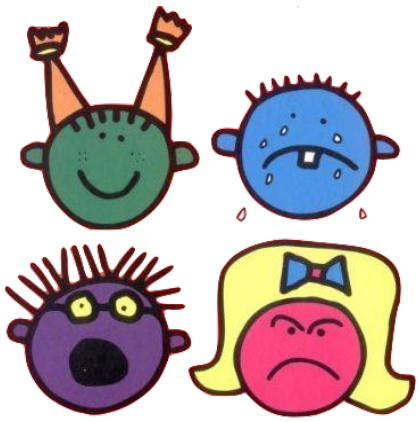
expressive phenomena like rumbling tummies and smiling. As we have seen, this ability to assign emotion states to expressions is a prerequisite for more complex inferencing capabilities. Another observation with the same child further elucidates this.

Observation B

Participants: Child 2 (2:5)

Child 2 brings a book to the teacher to read called *The Feelings Book*[7]. The cover is compartmentalized into four sections each featuring a face displaying a different emotion (see image 1.1. below). We sit down to read the book and he points to each of the faces starting with the face in the square on the bottom right: "This is a mad face; this is a sad face; this is a loud face; this is a happy face."

Image 1[8]



Here, the child clearly recognizes and points out affective states on the book cover — a fledgling instance of cognitive empathy. He uses this ability to attribute feeling states to

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[7] Parr, T. (2000). *The Feelings Book*. New York: Little, Brown and Company.

[8] *Ibid*.

facial expressions, an important prerequisite for a more complex awareness of differentiated internal states later on. Like Dunn suggests, the ability to recognize emotional states may precede the ability to recognize other mental states. It is an important operational milestone. The ability to make a claim about another's feelings based on their expressions is inherently part of the trajectory because of how intertwined theory of mind and cognitive empathy are (Hodges and Myers, 2007).

Recognizing another's diverging feeling state immediately differentiates the child from the other who is feeling differently. Affect and facial expressions are important facets of social knowledge when we are able to recognize them and ultimately make inferences from them. They are powerful referencing agents in social situations and can and will inform how we intend to interact with another person. This kind of recognition can be applied to virtually all areas of interpersonal exchange. It requires a child to make the connection between external behavior and internal states and adds to the child's growing database of social information. More social information allows for more complex inferences. It is important to consider how his behavior is a relevant part of the process and even more so a necessary piece of the theory of mind puzzle. This becomes more blatantly clear if we consider a child who is not able to recognize emotions and facial expressions in a book or elsewhere in the environment.

Observation C

Participants: Child 7 (3:0), Teacher

> Child 7 is playing on the reading rug with a collection of toy cars and a wooden garage. I am sitting on the rug near him, and he turns to me.

Child 7: “I need someone to play with me.”

Teacher: “Do you want to ask if another child would like to play with you?”

Child 7: “It needs to be a teacher.”

Teacher: “Would you like me to play with you?”

Child 7: “Yes!”

Based on previous experience with this child, it was immediately clear to me that when he said he needed someone to play with, he was implying that he wanted me to play with him. This is an observation of the manipulative function of theory of mind. We had been playing together earlier that day, and in suggesting that he needed a play partner that was specifically a teacher, he seemed to have a certain goal in mind that he was not explicitly stating. He constructed a dialogue that made offering myself to be the play partner a very logical response. For whatever reason, he wanted me to offer to play as opposed to asking me explicitly and thus successfully fabricated a situation in which he could essentially make me do that. This required him to presume a certain train of thought on my part. However consciously or subconsciously the process was for him, he seems to have employed a theory of mind process to do this. I believe that he anticipated that I would offer to play in response to his first declaration of need. When I did not, instead of asking me outright, he added another stipulation that narrowed my response options and made offering myself the most convenient and compatible with his request. The other options would have been to involve another teacher or to decline his request altogether, neither of which were likely to happen.

Other naturalistic observations of this child’s behavior in the classroom support my belief that this process was driven by theory of mind. For example, he has a tendency to hide

toys from other children and when doing so, says that he is hiding a certain toy somewhere where another child will not be able to find it. If simply looking at this child's unsuccessful task results, one would not have attributed false-belief comprehension to him. However, his tendency to conceal toys from other children suggests otherwise. In these hiding situations, he has privileged knowledge about where the toy is concealed, much like the privileged knowledge in the false-belief task. He clearly understands that when he moves a toy to another spot, there is crucial information that the other child is not privy to and will therefore be unsuccessful if they try to look for the toy in its original spot. Other standard false-belief tasks like Change in Location employ this very kind of awareness (Saracho, 2014b; Wimmer & Perner, 1983). Perhaps Dunn's observations of children's notably "mature" behavior in disputes or emotionally vivid situations apply here. We might consider the notion that his awareness of false belief could be present in some situations and not others. In these hiding situations, he is anxious about other children taking the toys he wants to use. It seems that the child might be better able to employ an understanding of false belief in a situation in which he is emotionally invested, even though this understanding did not seem available to him during the task (Dunn, 1991).

Discussion of Task and Observations Results

While there is some variation in the results presented here, the implication is that children under the age of three are less likely to comprehend a verbal false belief task. The task results illuminate an overwhelming inability to succeed on a false-belief task at this age. However, what many of these results do not represent is an awareness of mental states that has not yet reached the threshold of false-belief comprehension or at least some kind of

linguistic expression of it. Yet, the task results of this group of children do not explain the very same children's daily behavior. This suggests that they have an awareness of mental and emotional states that is not represented by the task results.

The children seem to be already aware of and engaging with mental states and perhaps even some subconscious understanding of false belief. In the spirit of being aware of the limitations of naturalistic observations, I turn to Frye and Moore: "they are at least suggestive of sensitivity on the part of the young preschooler to the existence of mental life" (1991, p. 7). After all, some research has shown that three-year-olds are likely to choose "mental descriptions" versus behavioral ones when describing images (Meltzoff, 2000). One would describe an image of a bunny looking down at the ice cream that dropped on the floor in one of two ways. One will either say something akin to 'the bunny is [sad] about dropping the ice cream' — emphasis on an emotional state — or 'the bunny is looking at the ice cream on the floor' — emphasis on a behavior. Meltzoff suggests that three-year-olds will tend toward the former. Indeed, from what I observed, the quality of the descriptions children used to talk about people and situations are consistent with his claim. This makes the task results seem misaligned with the apparent awareness of perspective characteristic of the children in the classroom context outside of the task. In light of the combined results, the question that begs to be asked is, if young children do have some possession of theory of mind and comprehension of false belief at a young age, then why might children fail on a verbal false-belief task like this one?

The observations could be indicative of varying degrees of mental insight that evolve over time and development. Similar to the ideas of Frye and Moore, Jean Briggs' interpretation of the different kinds of human awareness might provide some explanation.

> I assume that any person "knows" in a variety of modes —that is, experiences different kinds of awareness; that awareness constitutes a continuum and so may exist in different degrees; and that awareness fluctuates, so that a person may be distinctly aware of a motive, an emotion, a wish in one mode or at one moment in time and less aware, or not aware at all, in a different mode or at another moment. (Briggs, 1998, p.16)

The idea that awareness fluctuates or exists on a sort of spectrum and depends on the variables of a particular moment in time might be helpful. This paradigm provides another possible explanation for the variation in success on implicit and verbal false-belief tasks with young children. It would require one to assume the notion that theory of mind and false-belief comprehension do not activate in all perspective-taking situations at the flick of a switch. They do not appear at some precise point in development, but rather become increasingly applicable and available to more and more life situations as a child goes through life.

Similarly, De Bruin (2014) suggests that these kinds of tasks only account for conscious theory of mind mechanisms but that these processes are only accessible to the children subconsciously. This would make it difficult, indeed impossible, for the child to apply language to what they are not consciously processing. This is a possible explanation for the perplexing task results of Children 6 and 7 who both seem to have some comprehension of false belief but who clearly are capable of expressing this awareness in different contexts. Indeed, what is perhaps most intriguing about this study is the difference in participant results, namely those of Children 6 and 7.

Child 7 seems to exhibit an understanding of false belief in the classroom when the integrity of his toys, exclusive play space and other play needs are particularly vulnerable. This vulnerability is hard to avoid in a room full of two-year-olds. For him, these are significant emotionally-charged instances, which could activate the child's more "mature" intelligence, as Dunn suggests, but on a level that might not be available to the child in all situations. Alternatively, unlike play, the task presents a situation that is completely hypothetical and removed from the immediate context of the present classroom activity or real-time social situation like the ones Dunn and Winner described. Perhaps the accessibility of false-belief is tied to his personal emotional investment, the immediacy of the situation, and the risk that is involved. This would imply that his emotional investment on the false-belief task was relatively low. It did not invoke his need to stake a claim to toys nor his tendency to conceal the whereabouts of those toys from the other children. Moreover, I (a teacher) was leading the exchange, which, while making it more impersonal, could have added to the implicit 'safety' of the situation, and thus might not have sparked the need to employ this kind of social intelligence. The context of play might also be worth considering as play is a common language and familiar setting for these children. Perhaps his understating of false belief was able to be translated in a playful context and not through that of the contrived task.

I also do not think that the diverging social tendencies of Child 6 and 7 are coincidental and therefore should not be overlooked. As the development of theory of mind and false belief seem to flourish in social settings — within family systems, interpersonal discourse about mental states, linguistic exchanges in general and play — their social behavior might be, at least in part, a focal point for understanding their perspective.

Indeed, the results of the two children's tasks are likely the product of more than one variable and are, perhaps most importantly, inseparable from what the child him- and herself brings to their interactions with the world. It is highly possible that there is a marked difference in these children's opportunities for explicit discourse about mental states using mentalistic terms. It is also possible to consider the significance of family size, genetic influence, social tendencies, language, personality and temperament, all of which are variables that have been suggested throughout the literature as integral to the development of theory of mind and false-belief comprehension in young children.

4. Conclusion

Exploring the roots and developmental trajectory of theory of mind in young children grounds our understanding of human sociability in the long run. Whether children arrive in the world with certain predispositions to conceive of other perspectives or not, the development and cultivation of these capabilities equip people with a powerful social tool. Research that focuses on the connection between theory of mind, false-belief understanding and sociability later in life convincingly emphasizes the need to pay special attention to this area of social and cognitive development.

The definition and theoretical lens that are used to consider theory of mind in young children change the way that we understand its existence. While false belief has been the historical marker of a child's coherent possession of theory of mind, it seems that verbal tasks like these only scratch the surface of what and perhaps more importantly *how* children are conceiving of the internal states of other people. This is exemplified in my own findings and in the findings of others whose research emphasizes other areas of child development to support these claims. Research in imitation, intentionality, sharing affect and joint attention point to the potential roots of theory of mind in infancy and other tasks suggest fledgling false-belief understanding in children significantly younger than three. Even daily naturalistic observations like the ones included here enrich what we know about theory of mind and false belief in a way that contrived tasks might not be able to.

Despite its origins, it is clear that theory of mind evolves over time and development. It has the potential to become more complex and more insightful as information about people's thinking increases. With this complexity comes an increasing mutuality between a child and their social world. As the child begins to understand more about mental states,

theirs and those of others, they are able to make more complex social inferences, engage in and understand more nuanced social behaviors and even alter behavior based on these understandings (e.g. Frye 1991; Meltzoff, 2000; Michlmayer, 2002;). What we know about the beginnings of theory of mind is bound to the things that feed its progression. Several major agents that nourish its development are attachment, family systems, discourse about internal states, language and cooperative pretend play. It is not coincidental that each of these represents one of many diverse social domains that require the child to be in tune with another individual. These situations are opportunities for children to fine-tune their interpretive skills. Those skills in turn contribute to more complex abilities, both pro and anti-social in nature. While the capacity to share, predict, manipulate, infer or comprehend mental states does not have inherent positive or negative social impact, this intelligence allows human beings to achieve both sorts of goals. The ability to have insight into another's mental state using theory of mind is both predictive of prosocial skills in peer interaction (Peterson et al., 2016), and linked to intelligent forms of bullying (Hughes & Leekam, 2004). Therefore, theory of mind is a necessary but insufficient variable in the road to behavior that is prosocial and, simply, kind. Otherwise stated, "Empathy grounds morality, but morality goes beyond empathy" (Gopnik, 2010, p. 210). This gets at the heart of the different forms of empathic responses and the social moves available to those with access to more or less social information.

Part of the value of exploring the nature of mental-state awareness in young children is in the consequent realization that children understand and are attuned to more than they are usually given credit for. What we might find is that their processes of revealing all that they are capable of is not readily accessible to adults who no longer remember their mental lives

as infants or toddlers. Indeed the call for novel task procedures is not new, but it is important to emphasize. We should not underestimate what we can learn from the mental lives of young children, for they will be older children, adolescents, teenagers and adults equipped with a mental insight deriving from early-life experiences and the power to act on those insights. Indeed the deeper I dove into this work, the less convinced I was that the adult ability to infer mental states was that much more coherent than the young child's. Passing observations on subway platforms, street corners, in grocery lines and train cars made it clear to me that while adults may solidly understand that mental lives underlie behavior, the inferences that they make and behavior they exhibit based on those insights are anything but consistent or consistently accurate. We are prone to misread, misattribute, and misunderstand and the tendency to apply our own "privileged" information to others is not at all lost with age. Keeping this and the ideas presented in this thesis in mind, may we deeply consider our abilities to be in-tune with one another and seek to better understand the power of our own perspectives and the utterly distinct perspectives of others.

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