

Parental Behaviors as a Function of Perception

by

Mia Chow Letterie

A thesis submitted in partial fulfillment of the requirements
for graduation with Honors in Psychology.

Whitman College
2018

Certificate of Approval

This is to certify that the accompanying thesis by Mia C. Letterie has been accepted in partial fulfillment of the requirements for graduation with Honors in Psychology.

Matthew Prull, Ph.D.

Whitman College
May 9, 2018

Table of Contents

Acknowledgements.....	iv
Abstract.....	v
List of Figures and Tables.....	vi
Parental Behaviors as a Function of Perception	1
Mind Perception.....	3
Caregiving Behavior	5
Elements of Caregiving.....	7
Emotional States	7
Depression.	8
Paternal Depression.	9
Present Study	10
Hypotheses	10
Method	12
Participants.....	12
Measures	12
Demographics.....	12
Parenting behaviors.	13
Emotions.....	14
Other measures.	15
Procedure	15
Results.....	16
General Discussion	18
References.....	24
Figures.....	28
Tables.....	32

Acknowledgements

First and foremost, I would like to acknowledge my professors at Whitman College, specifically thank you to Matthew Prull, Ph.D. for his constant feedback and ability to challenge my ideas, to Erin Pahlke, Ph.D. for sharing her statistical knowledge, and to Kathryn Humphreys, Ph.D. for her endless support and mentorship. Thank you to the Stanford Neurodevelopment, Affect, and Psychopathology Laboratory for their funding that made this research possible. Finally, thank you to my parents, Jane Chow and Gerard Letterie who have made my years of education possible and supported me throughout.

Abstract

This study examined parents' mind perception of infants and young children and associations between mind perception and self-reported caregiving behaviors. The aims of this study were to (1) extend mind perception to young children of varying ages, (2) examine the correlates of mind perception (e.g., depression), (3) assess the association between mind perception of young children and caregiving behaviors, and (4) analyze mind perception as a mediator on the effects of depression on caregiving. Parents rated images of individuals of varying ages on 20 dimensions of agency and experience. All parents completed measures of depression and parenting behavior to assess dimensional depression symptoms and self-reported caregiving respectively. Results suggested that perceptions of capabilities for both agency and experience increase as age of image increases. Depression was not significantly associated with ratings of mind perception in young children, and despite previous theories punitive caregiving was also not associated with agency. Mind perception also did not serve as a mediator for the effects of depression on punitive parenting. Future analyses should focus on the connection between mind perception and other parentings behaviors such as inconsistent parenting or positive parenting. Results are discussed within the existing frameworks of mind perception, depression, and caregiving behaviors.

Keywords: mind perception, caregiving, depression, infant development

List of Figures and Tables

Figure 1: Mediation model of mind perception on the association of depression and caregiving.....	[#]
Figure 2: Change in Mind Perception as a Function of Age and Type of Measure (Agency and Experience).....	[#]
Figure 3: Scatterplots of 12 – 36 month Agency vs. Experience (Panel a) and 12 – 36 month Experience vs. Depression (Panel b)	[#]
Figure 4: Scatterplots of Young Child Agency vs. Depression (Panel a) and Young Child Experience vs. Depression (Panel b).....	[#]
Table 1: Multiple Regression Analysis for Punitive Parenting	[#]

Parental Behaviors as a Function of Perception

Everyone passes judgment on others, whether we are meeting someone for the first time or seeing a familiar face in a new situation. *Mind perception* refers to the basic assumptions we make about other people and the ways in which we perceive other people's mental capabilities. Mind perception has been studied across various characters (Gray, Gray & Wegner, 2007; Weisman, Dweck & Markman, 2017). Differences in assessment of capabilities and assumptions of experience within mind perception have been established (Gray, Gray & Wegner, 2007; Weisman, Dweck & Markman, 2017). These judgments of mind perception relate to the way individuals interact with others (Gray et al., 2007; Weisman et al., 2017). For example, mind perception is related to our actions and attitudes towards people, such as how much we value others, our desire to protect someone or something from harm, to make others happy, or to determine whether another individual is deserving of punishment (Gray et al., 2007). Gray et al. (2007) introduce the fact that large disparities exist in judgment of capabilities and experiences of infants when compared to adults. The study and interpretation of mind perception among parents has the potential to advance our understanding of individual differences in parental behaviors, from discipline to reward, given that our expectations of others affect our treatment of them.

Previous literature has clearly documented the influences of caregiving behaviors on infant development. Caregiving behavior is influenced by many factors and has the potential to be influenced by mind perception. Previous research has demonstrated the impact of many factors, such as socioeconomic status, parental depression, and emotional control, on parenting behaviors. Poverty has been

convincingly shown to be a negative contributor to caregiving behavior (Goodman, Rouse, Connell, Broh, Hall & Heyward, 2011; Humphreys, Zeanah, & Scheeringa, 2015; Petterson & Albers, 2001). Further research suggests that poverty increases mental health risk factors, causing a higher chance of psychopathology in infants growing up in poverty (Goodman et al., 2011). Depression has also been extensively established as a risk factor for parental behaviors (Field, 1998; Goodman et al., 2011). In contrast, studies have shown that children of well-educated and psychologically stable mothers are more advanced developmentally than children with less educated or depressed mothers (Coleman & Karraker, 2003; Goodman et al., 2011). Parental emotional control has also been established as a factor that influences caregiving behavior. In addition, parents' expression of emotional stress is strongly related to children expressing anger, irritability, and developing mistrust (Conger, McCarty, Yang, Lahey, & Kropp, 1984). Furthermore, parental sensitivity, defined as the ability for a parent to consistently and accurately respond to their infant, is crucial for the healthy development of infants (Niessen & Konrad, 2017). These influences on caregiving are essential to understand and investigate further to better address development and neglect of children. Many of these factors contribute to establishing and understanding developmentally appropriate expectations, which in turn allow for a better environment and parental engagement in positive caregiving to foster development in the early years of a child's life.

While many studies have explored the parameters that influence caregiving and parental psychological states, little research has examined the intersection between mind perception and caregiving. The aim of the present study is to determine the

influence of mind perception on caregiving behaviors first by examining age differences in mind perception, second through the influence of depression on mind perception, third through determining if caregiving behaviors are associated with mind perception (e.g., punitive behaviors) and finally, through examining mind perception as a mediator of depression's effect on caregiving. Furthermore, this study will address the question of whether mind perception predicts the expectations parents establish for their children.

To best address the ideas above, there must be a thorough understanding of the previous contributions that shape this research. First, I will review the existing research on mind perception and the established differences in assessments of agency and experience across different characters. Second, I will discuss caregiving behaviors and their impact on infant development. Finally, I will turn to the various factors that influence caregiving, specifically the emotional impacts and depression in both mothers and fathers. Each of these topics contribute to a greater understanding of how parents develop ideas about infants and the effects that these perceptions have on expressed caregiving behaviors.

Mind Perception

Mind perception refers to the assumptions of who has a mind and the different capabilities of each mind (Gray et al., 2007). Previously, researchers believed that mind perception existed on one level: something either has a mind or it does not (Gray et al., 2007). However, more recent research has shown that mind perception can be measured along more than one dimension. Gray et al. (2007) demonstrated that mind perception exists on two levels: agency and experience. *Agency* includes questioning

capabilities of memory or decision making, whereas *experience* questions capabilities of an individual to feel emotions such as: happiness or anger. Gray et al. (2007) separated mind perception into the categories of agency and experience using agency as a measure of moral judgment and responsibility while experience measures moral patience and the rights and privileges of an individual. The present study adopted Gray et al.'s (2007) two levels of mind perception while incorporating questions from a second study of mind perception by Weisman et al. (2017) to allow for inclusion of all factors.

Gray et al. (2007) used these two levels of mind perception to detect perceived differences in mental capacities of various characters such as monkeys, robots, humans, dogs, cats, and humans in vegetative states. Gray et al.'s (2007) study showed that individuals perceive infants significantly lower in levels of mind perception (agency and experience) when compared to adults or other characters. Previous literature shows that infants are consistently perceived to have a lower mental capacity than adults, children, and even some animals, suggesting that individuals view infants as less capable and less valued than adults (Gray et al., 2007; Weisman et al., 2017). Understanding the differences in mind perception across the first three years of a child's life would allow for a more comprehensive perspective on caregiving behaviors.

The connection between mind perception and the assumptions of mental capacities is correlated with a desire to care for a creature and designate an importance to the character (Gray et al., 2007). Gray et al.'s (2007) study proposes that others who are rated higher in both levels of mind perception will be better cared for than others

who are rated lower in levels of mind perception. Additional literature also showed that individuals see others as more valuable when they perceive them to have higher levels of mind perception (Waytz, Gray, Epley, & Wegner, 2010). When applied to infants, this idea suggests that infants will be less cared for or desired if they are perceived to have lower mental capacities. Thus, low levels of mind perception have the potential to cause maltreatment or neglect towards specific individuals due to perceived capabilities (Weisman et al., 2017).

Caregiving Behavior

Quality of caregiving, including levels of neglect, has the potential to enhance or inhibit an infant's development (Ainsworth, 1989, Coleman & Karraker, 2003). These behaviors include a mother's ability to interact socially with her child and to provide responsive care to improve early development (Cohen & Beckwith, 1977). Conger et al. (1984) suggests that positive parenting includes engaging in nurturing, non-coercive, and supportive behaviors. These caregiving behaviors are essential to understand because they directly influence a young child's development; specifically, the development of cognitive skills, social skills, and a child's understanding of the world and relationships (Humphreys et al., 2015; Slade, 2005). Within the first year of life, maternal sensitivity behavior is strongly correlated with an infant's positive mood, social, and play behaviors, as well as their ability to learn visual cues (Humphreys et al., 2015). Caregiving behaviors are essential in these first few years of life to allow an infant to properly develop.

As mentioned earlier, poverty has been clearly documented as a contributor to negative parenting (Goodman et al., 2011; Humphreys et al., 2015; Petterson & Albers,

2001). Socioeconomic status and parental education have both been established as strong influences of caregiving behaviors, such that stable socioeconomic status and high parental education enhance parenting behaviors and have a positive impact on child development (Coleman & Karraker, 2003; Conger et al., 1984). Furthermore, studies have shown that children whose mothers did not complete high school experienced lower levels of both cognitive and motor development when compared with children of mothers who completed a high school education (Pettersen & Albers, 2001). However, additional forces can influence caregiving. For example, family size has the potential to influence caregiving behaviors (Cohen & Beckwith, 1977; Vandell, 1996). Young children who grow up with more one-on-one parental attention tend to be more advanced developmentally compared to those who grow up in a household with other siblings or shared attention (Cohen & Beckwith, 1977; Vandell, 1996).

Studies show that certain environments can also affect parenting behaviors (Conger et al., 1984). Stressful environments can impact a parent's psychological well-being (Conger et al., 1984). Parents then are more likely to engage in obedience-focused parenting methods and in negative parenting practices that achieve rapid compliance (Conger et al., 1984). These obedience-focused parenting practices typically include more physical and aggressive parenting to achieve immediate results rather than engaging in parenting practices such as patient lesson teaching. These factors all contribute to the way a parent interacts with their child. I will examine these elements of caregiving further, and then this study will examine the potential for mind perception to also contribute as a determining factor of caregiving behaviors.

Elements of Caregiving

Emotional States.

Various emotional states contribute to parenting behaviors. Kilpatrick (2005) identified a lack of parental empathy as a contributor to negative parenting behaviors. Another emotional capacity that influences parenting behavior is reflective functioning. Reflective functioning directly refers to the ability of a parent to understand a child's underlying mental states and intentions, and then empathize with these mental states (Slade, 2005). Reflective functioning highlights a parent's ability to empathize with their child whereas mind perception only examines a parent's ability to assess capabilities. A parent's use of reflective functioning is essential for understanding and empathizing with a child's behavior and capabilities. In Slade's (2005) study, many parents did not engage in reflective functioning or reported low levels of empathy, resulting in negative parenting behaviors. Reflective functioning and empathy levels are important for a parent's ability to recognize distress in an infant and to provide reliable and appropriate responses to a distressed infant (Niessen & Konrad, 2017). The ability for a parent to recognize and respond to distress in an infant, also referred to as parental sensitivity, is crucial to socioemotional development (Niessen & Konrad, 2017). Reduced parental sensitivity is also associated with negative parenting behaviors (Coleman & Karakker, 2003).

Furthermore, it is important for parents to establish developmentally appropriate expectations for their child to ensure positive caregiving. Through establishing proper expectations, parents may engage in less discipline and obedience-focused parenting. Parental sensitivity and parental reflective functioning are factors of

caregiving that have been well documented to demonstrate the effect external factors can have on research. However, studies on additional elements of caregiving behavior and their effect on infant development must be reviewed to better understand caregiving behaviors.

Depression.

Depression has been repeatedly linked to adverse childhood outcomes, poor caregiving, and negative infant-mother relationships (Field, 1998; Goodman et al., 2011; Goodman & Gotlib, 1999; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Tronick & Reck, 2009). Previous literature has clearly documented the impact of maternal depression, specifically on children's cognitive, social, and emotional development (Field, 1998; Goodman et al., 2011; Goodman & Gotlib, 1999; Petterson & Albers, 2001; Tronick & Reck, 2009). Research has focused on both the biological and the environmental impacts of maternal depression. Field's (1998) study demonstrated physiological and biological symptoms of depression in infants and suggested that infants can be influenced by maternal depression as early as birth. Additionally, depression is thought to have a high degree of heritability (Goodman & Gotlib, 1999). Goodman and Gotlib (1999) proposed a model that explains maternal depression by integrating both genetic and environmental factors. This model describes the characteristics of maternal depression and suggests that the negative cognitions and affect expressed by depressed mothers leave a mother unable to meet an infants' social and emotional needs, which in turn causes a developmental delay (Goodman & Gotlib, 1999). These parenting behaviors lead to an increased risk of psychiatric problems for a

child as well as stunting the development of a child's social skills (Anderson & Hammen, 1993).

Along with the effects of depression on parental behavior, the environment established by a mother is also essential to infant development. Mothers experiencing depression engage in caregiving behaviors that are more hostile and coercive than mothers who do not experience depression, creating a more hostile home environment (Lovejoy et al., 2000). Previous research has established infants' tendency to mirror parental behavior, in more hostile environments infants will mirror these negative behaviors (Goodman & Gotlib, 1999; Tronick & Reck, 2009). Furthermore, development is most impaired in infants with depressed mothers when compared to infants of non-depressed mothers (Goodman et al., 2011; Lovejoy et al., 2000). This well-established relationship between depression and caregiving emphasizes the importance of understanding the potential mechanisms by which depression is associated with negative caregiving behaviors.

Paternal Depression.

The effects of maternal depression have been heavily studied, however less research exists on the effects of paternal depression on caregiving. There is an emphasis on maternal depression in existing literature because of the traditional belief that mothers are the primary caregivers and are therefore more influential in early childhood development (Connell & Goodman, 2002). However, fathers are also an important role for a child's development (Connell & Goodman, 2002). Studies have shown that non-depressed fathers can serve as a buffer between depressed mothers and their infants, creating a more positive environment for children's development (Field,

1998). Thus, depressed fathers could create a more negative environment by being unable to intervene between depressed mothers and their infants, thereby increasing the risk of child psychopathology (Goodman & Gotlib, 1999). Studies continue to suggest that fathers are a crucial buffer for children with depressed mothers and serve as a protection mechanism while they promote their child's development (Goodman & Gotlib, 1999). While there is extensive research on the influences of depression on caregiving behaviors, it is essential to continue to question both the paternal and maternal roles and their contributions to a child's development.

Present Study

This study examines a potential connection between mind perception and caregiving behaviors through four main analyses. This study expands the known connection between mind perception and character differences by determining whether perceptions of mental capacities exist for others at smaller age increments, specifically across the first three years of development. As previous literature explains, depression has a well-established connection to caregiving behaviors. This study examines any effects of depression on mind perception. I will also analyze a potential connection between mind perception and caregiving behaviors, an area of study that has very little contributing research. Lastly, this study will investigate mind perception as a mediator of depression's effect on caregiving behavior.

Hypotheses

Previous research leads me to make several predictions. First, I predict an increase in mind perception, on levels of both agency and experience, as age of the

individual presented in the image increases. This hypothesis is based on both Gray et al. (2007) and Weisman et al.'s (2017) studies that found infants were rated lower in both agency and experience when compared to other characters. Second, I predict that depression will be associated with increased capabilities of agency and reduced capabilities of experience regarding young children. The connection between depression and mind perception has not been previously researched, however the current literature demonstrates a high influence of maternal depression on caregiving behaviors (Field, 1998; Goodman et al., 2011; Goodman & Gotlib, 1999; Lovejoy et al., 2000; Tronick & Reck, 2009). Given existing research on the behavior in which depressed parents engage, such as an inability for mothers to meet infant's needs (Goodman & Gotlib, 1999), I hypothesize a reduced expectation of experience and an increased expectation of agency to compensate for the lack of parental support from depressed parents.

Third, I predict that perceptions of young child agency will be correlated with harsh parenting behaviors, such that parents who rate young children as having higher levels of agency will engage in harsher discipline compared to parents who rate young children with lower levels of agency. There is less research examining this relationship between mind perception and caregiving behaviors. However, high levels of agency suggest higher capabilities and independence as well as an increase in responsibility (Gray et al., 2007). Therefore, parents who rate infants as higher in agency will establish higher expectations and be more likely to engage in punitive discipline measures when these expectations are not met. Finally, given previous literature and the known association between depression and caregiving (Field, 1998; Goodman et

al., 2011; Goodman & Gotlib, 1999; Lovejoy et al., 2000; Tronick & Reck, 2009), I predict that agency and experience will mediate the association between depression and caregiving as shown in Figure 1.

Method

Participants

Sixty-four participants, 28 of whom were mothers and 36 of whom were fathers (13% Hispanic, 87% Non-Hispanic; 9% American Indian, 25% Asian, 8% Black or African American, 2% two or more races, 55% White, 1% Prefer not to answer), completed an online survey. The average age of the participants was 34 years old and all were parents of children between 12 – 36 months. Four hundred and seventy-nine people also participated in the online survey but were excluded from the reported results for the following reasons: 0.7% did not agree to the conditions presented in the informed consent form, 14.1% did not complete the survey in its entirety, 0.1% were not fluent in English, 12.1% were not residents of North America, 4.6% failed the check question, 5.5% were not parents, 2.9% reported their oldest child to be under 12 months, and 60% had a child over the age of 36 months.

Measures

Demographics.

Participants were asked to complete a demographics questionnaire prior to answering any other questions. The demographics questionnaire established that participants fulfilled requirements for the survey and gathered background information on participants. Background information included age of participant, race, ethnicity,

country of residence, education level, age of oldest child, sex of oldest child, and primary language spoken.

Parenting behaviors.

Mind perception.

The mind perception questionnaire was used to measure changes in parents' perception of an individual's capabilities across varying ages. The questionnaire was based on two different mind perception measures (Gray et al., 2007; Weisman et al., 2017). The questionnaire developed for this study consisted of 20 questions regarding perceived capabilities of eight individuals of varying ages. The mind perception questions measured capabilities on the two levels of agency and experience. Sample questions consist of *How capable are people of these different ages of making choices?* (agency) and *How capable are people of these different ages of feeling happy?* (experience) to which people responded using a numerical scale in which 0 signified *not at all capable* and 6 signified *highly capable*. This agency component of this measure had an average reliability of 0.93, while the experience component had an average reliability of 0.98 (reliability values throughout are from the current study and not from previous studies). The categories of agency and experience were taken categorized based on the Gray et al. (2007) study. Participants were given eight images of individuals of varying ages and asked to respond to each image using the same 20 questions. The eight images were, in order: newborn, 6-month-old, 12-month-old, 18-month-old, 36-month-old, 13-year-old, 30-year-old, and a 70-year-old. Images and the order of images were held constant for each participant across all 20 capabilities. Participants were randomly assigned to images of either eight males or eight females.

Alabama Parenting Questionnaire – Preschool Revision (APQ-PR).

I used the Alabama Parenting Questionnaire (Preschool Revision) (Shelton, Frick & Wootton, 1996) to assess caregiving behaviors. Therefore, APQ-PR scores serve as the primary dependent measure of this study. Questions on the Alabama Parenting Questionnaire are meant to be responded to specifically with the participant's child in mind. This questionnaire is a 24-question self-report measure created specifically for parents of toddlers and infants. The APQ-PR provides an understanding of the caregiving behaviors in which parents engage. Answers were given using on a six-point numerical scale ranging from *Never* to *Always*. Two example statements are *You volunteer to help with special activities that your child is involved in* and *You threaten to punish your child and then do not actually punish him/her*. Scores are summed within the sub categories of positive parenting, inconsistent parenting, and punitive parenting. Total scores within each of these subcategories ranged from 3 to 50. High scores for involvement and positive parenting suggest engagement in positive parenting behaviors, whereas high scores for inconsistent parenting and punitive parenting imply parental engagement in poor parenting behaviors. In this study, only the sum punitive parenting scores were used. This measure has an average reliability of 0.87.

Emotions.

Center for Epidemiology Scale – Depression (CES-D).

This survey used the short form version of the Center for Epidemiology Scale – Depression (Kohout, Berkman, Evans, & Cornoini-Huntley, 1993) to measure parent's current level of depression. This measure included ten statements such as *I had trouble keeping my mind on what I was doing* with responses given on a four-point scale

ranging from *Rarely or none of the time (less than 1 day)* to *All of the time (5-7 days)*. This scale had an average reliability of 0.87. Scores are summed and can range from 0 to 33. Any score above ten suggests depression. The CES-D is used to measure current depression symptoms and is taken while reflecting on the participant's emotions within the past week.

Other measures.

Participants also filled out other measures: the Parental Attachment Level (PAL) (Taylor, Atkins, Kumar, Adams, & Glover, 2005), the Parental Reflexive Functioning Questionnaire (PRFQ) (Luyten, Mayes, Nijssens, & Fonagy, 2017), the Knowledge of Infant Development Inventory – Short Form (KIDI-SF) (MacPhee, 1981), the Interpersonal Reactivity Index (IRI) (Davis, 1980), the Interpersonal Reactivity Index – Parental Empathy (IRI-PE) (Stern, 2015), and the Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 2003). The purpose of these other measures was to test hypotheses for other research.

Procedure

Participants participated in this survey using Amazon's Mechanical Turk and the data were collected through Qualtrics. The data were gathered in November 2017. There were two different Mechanical Turk postings, one for mothers and one for fathers. The survey for mothers closed after ten days and the survey for fathers closed after 9 days. All participants had verified accounts, were required to be Amazon Mechanical Turk Master's workers, and indicated that they were parents whose oldest child was currently older than 12 months and younger than 36 months. Participants

were prevented from repeated participation. Each participant was compensated \$3.00 for completing the survey.

Results

All data were downloaded from Qualtrics then sorted and analyzed using SPSS. Data were scored using the scoring procedures described for each measure.

My first hypothesis predicted an increase in mind perception on both levels of agency and experience as the age of the individual in the image increased. To test this hypothesis, I ran a 2 (measure: agency, experience) x 8 (age: newborn, 6-month-old, 12-month-old, 18-month-old, 36-month-old, 13-year-old, 30-year-old, 70-year-old) fully within-group analysis of variance (ANOVA). The main effect of agency and experience was significant, $F(1, 63) = 98.30, p < .001$, where experience scores were significantly higher ($M = 4.37, SD = .08$) than agency scores ($M = 3.69, SD = .07$). The main effect of age was also significant, $F(7, 441) = 186.26, p < .001$. Figure 2 shows that as age increases mean scores also increase. Finally, the interaction between mind perception and age was significant $F(7, 441) = 64.78, p < .001$. Again, referring to Figure 2, the change from 18-month-olds to 36-month-olds has the largest difference in ratings of mind perception, where agency shows a differentially larger increase than experience.

Second, I hypothesized that depression would be associated with increased perceptions of agency and would reduce parental perceptions of experience in regards to young children. To test this hypothesis, I calculated an average CES-D score and average agency and experience scores for images of 12 to 36-month-olds. I then computed correlations and determined that both correlations were small and negative,

but neither were significant. Specifically, the correlation between depression and agency is $r = -.002, p = .99$ (see Figure 3, Panel a). The correlation between depression and experience is $r = -.19, p = .13$ (see Figure 3, Panel b). Therefore, this hypothesis was not supported. However, when agency scores of young children were expanded to include both 6-month-old images and newborn images, the correlations went in the right direction, but were still not significant. Specifically, the correlation between depression and agency was $r = .178, p = .16$ (see Figure 4, Panel a) and the correlation between depression and experience was $r = -.101, p = .43$ (see Figure 4, Panel b).

The next hypothesis predicted a correlation between young child agency and discipline-focused parenting behaviors, such that parents who rate young children as having higher levels of agency will engage in harsher discipline when compared to parents who rate young children with lower levels of agency. Parenting behaviors were measured using the APQ-PR, where higher scores were associated with higher levels of engagement in punitive parenting behaviors. I ran a two-step hierarchical regression to examine this hypothesis. As seen in Table 1, there was a significant relationship between the first block of predictors, which consisted of demographic variables and punitive parenting behaviors ($\Delta R^2 = .31, p = .01$). However, agency did not have a significant effect on punitive parenting behaviors ($\Delta R^2 = .02, p = .25$).

Finally, I predicted mind perception would mediate the association between depression and caregiving. To test my hypothesis that agency and experience mediated the relation between depression and caregiving, I used Hayes' (2013) PROCESS procedure, which is a bias-corrected approach that utilizes 1000 bootstraps. This approach examines the indirect effects of agency and experience. If the lower and

upper bounds of the bias-corrected confidence intervals do not contain zero, the indirect effect is significant. Inconsistent with my hypothesis, the direct effect of depression on caregiving (effect = .35, $SE = .09$, $CI = .18 - .53$) was not significantly mediated by either agency or experience. Neither the indirect effect associated with experience (effect = .37, $SE = .05$, $CI = -.04 - .15$) nor agency (effect = .04, $SE = .04$, $CI = -.02 - .14$) was significantly different than zero, indicating that neither agency nor experience significantly reduced the effect of depression on caregiving.

General Discussion

My first hypothesis predicted an increase in mind perception as image age increased. That hypothesis was supported. When researching mind perception, Gray et al. (2007) used a much broader spectrum of image characters, including animals and people of varying ages. Within the limited ages of images of human characters, Gray et al. (2007) found that mind perception increased on the levels of both agency and experience. The present results support Gray et al.'s (2007) study by suggesting that levels of mind perception increase as age of the image increases. The present results also extend the Gray et al. (2007) results by showing for the first time that levels of mind perception increase within infancy and toddlerhood. These results suggest that parental mind perception of young children changes dramatically across these first three years, a period proven to be crucial to a child's development. These changes in mind perception could result in inappropriate expectations for infants or negative parenting behaviors. Changes of a child's capabilities within these first three years are expected, however, as parents must be able to accurately assess a young child's capabilities to appropriately care for them while also allowing them to learn. When

parents misjudge these needs, they are more likely to engage in negative parenting behaviors and stunt a child's development. It is essential for parents to have developmentally appropriate expectations to provide the best environment for development.

Other research has extended the Gray et al. (2007) study and expanded mind perception beyond the two categories of agency and experience. Weisman et al. (2017) suggested three categories of mind perception: body, heart, and mind. These categories allow for examination of physiological sensations and biological needs (body), basic and social emotions (heart), and perceptual-cognitive capabilities (mind) within the broader category of mind perception. Weisman et al. (2017) argued that the categories of agency and experience do not properly address the existence of all mental capacities, whereas the three categories of body, heart, and mind allow for a more distinct separation between categories that also includes both agency and experience (Gray et al., 2007). Further research should be done to examine parental mind perception within these three categories to better establish an understanding of parental behavior and developmentally appropriate expectations for infants.

Next, I predicted that depression would be associated with an increased rating of agency and a decreased rating of experience in young children. This hypothesis was not supported. One possible reason for lack of an association can be low reliability. However, the reliability for both the mind perception questionnaire and the CES-D was high within this data set (reliability > 0.85), therefore the lack of correlation between mind perception and depression is not likely due to low reliability. The mind perception questionnaire was significantly shorter than any previous mind perception

questionnaire developed. This change in the questionnaire could affect the ratings of mind perception and change the correlation between mind perception and depression. Furthermore, depression might be unrelated to mind perception entirely. Therefore, further research should be done to examine the potential effects of depression across the three subsets of mind perception suggested by Weisman et al. (2017) and to examine the potential influence of other mental illnesses on parental mind perception of infants. Through a more comprehensive understanding of the influence of mental illness on mind perception, researchers could examine the influence on expectation differences of infants between depressed parents and non-depressed parents as well as the discrepancies in mind perception across other mental illnesses.

I also hypothesized that perceptions of young child agency would be correlated with harsh parenting behaviors. This hypothesis predicted that parents who rated infants higher in agency would report engaging in harsher discipline methods when compared to parents who rated young children lower in agency. This hypothesis was analyzed using hierarchical regression with demographic data in the first block and agency scoring in a second block. Together, there was a significant effect of both demographics and agency on caregiving behaviors, however independently agency had no significant effect on caregiving. As with the previous analysis, this null effect of agency on caregiving is not likely due to a low reliability issue, because the reliability of both the mind perception questionnaire and the APE-PE were above 0.85 for this given data set.

The results of this study contradict Gray et al.'s (2007) suggestion that levels of mind perception correlate with an individual's ability or desire to care for something

else. Only one section of the parenting questionnaire was used: the punitive parenting section, thus other research should examine potential relationships between mind perception and other categories of parenting. This study examined parents of children between the ages of 12 and 36 months only. These parents might have children that are too young for punitive parenting methods. Future studies should expand the age group and look at a wider range of ages to determine if the existing changes in mind perception affect caregiving behaviors in later months or years of development. Punitive caregiving could also be a result of a lack of parental sensitivity or empathy rather than assessment of capability. This study opens the potential to explore the influence of appropriate expectations within parents and for caregiving behaviors to be examined from another dimension. This study should be extended to examine the potential relationship between higher ratings of mind perception and developmentally appropriate expectations as well as the relationship between developmentally appropriate expectations, and caregiving behaviors.

This study was limited by its lack of cultural or ethnic differences and does not extend to other mental illnesses beyond depression. Therefore, caution is warranted when trying to generalize these results to all parents (Sue, 1999). Cross cultural differences in mind perception may exist and could change the reported levels of mind perception depending on a culture's beliefs in child rearing or understanding of child development. Sue (1999) discussed the problems of having a participant pool limited to America, stating that the United States is 5% of the world population and therefore researchers cannot make assumptions that their results are applicable beyond the population studied. When examining the sample of this study, the participants were

limited to residents of North America, and thus cannot be applied to populations beyond North America. Furthermore, Sue (1999) commented that many measures used in America are not accessible to minority groups due to language and meaning differences. Thus, the results of this study may be different among minority groups, such as ethnic or racial minorities. Lastly, this study is reliant on self-reported measures, therefore differences between actual beliefs and practices and reported beliefs and practices must be considered.

Although there are many limitations, this study reached many participants and collected extensive data. By distributing this study through Amazon's Mechanical Turk, participants could access this survey throughout North America. Furthermore, there is the potential for this study to be extended to participants globally through Amazon's Mechanical Turk. Through Qualtrics, this study collected data on many different measures including extensive demographic information and could exclude or include participants based on basic information. These strengths also allow for extensions of this study or similar examinations of the relationship between mind perception and caregiving.

The results of this study suggest that mind perception does not have a significant effect on caregiving, either as a mediator of depression's effect or as a direct effect on punitive caregiving. However, there is a clear and significant difference of mind perception across ages with infancy and toddlerhood, and further research should examine these differences and their potential connections to parenting and expectations for infants. The study of parental mind perception has the potential to be used to better understand the influence of mental health on parenting behaviors and intervene to

create safer and more beneficial environments for children. Research within mind perception is just beginning and the study of parental mind perception has future directions that could positively influence the lives of young children and enable parents to provide a more stable home environment.

References

- Ainsworth, M. D. (1989). Attachments beyond infancy. *American Psychologist, 44*, 709-716.
- Anderson, C. A., & Hammen, C. L. (1993). Psychosocial outcomes of unipolar depressed, bipolar, medically ill, and normal women: A longitudinal study. *Journal of Consulting and Clinical Psychology, 61*, 448-454.
- Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T.,...Zule, W. (2003). Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse and Neglect, 27*, 169-190. doi: 10.1016/S0145-2134(02)00541-0.
- Cohen, S. E., & Beckwith, L. (1977). Caregiving behaviors and early cognitive development as related to ordinal position in preterm infants. *Child Development, 48*, 152-155.
- Coleman, P. K., & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers' behavior and developmental status. *Infant Mental Health Journal, 24*, 126-148. doi: 10.1002/imhj.10048
- Conger, R. D., McCarty, J. A., Yang, R. K., Lahey, B. B., & Kropp, J. P. (1984). Perceptions of child, child-rearing values, and emotional distress as mediating links between environmental stressors and observed maternal behavior. *Child Development, 55*, 2234-2247.
- Connell, A. M., & Goodman, S. H. (2002). The association between psychopathology in fathers versus mothers and children's internalizing and externalizing

- behavior problems: A meta-analysis. *Psychological Bulletin*, 128, 746-773. doi: 10.1037//0033-2909.128.5.746.
- Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 10, 85.
- Field, T. (1998). Maternal depression effects on infants and early interventions. *Preventative Medicine*, 27, 200-203.
- Goodman, S. H., Rouse, M. H., Connell, A. M., Broh, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, 14, 1-27. doi: 10.1007/s10567-010-0080-1.
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, 106, 458-490.
- Gray, H., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science*, 315, 619.
- Humphreys, K. H., Zeanah, C. H., & Scheeringa, M. S. (2015). Infant development: The first 3 years of life. In A. Tasman, J. Kay, J. A. Lieberman, M. B. First, & M. B. Riba (Eds.), *Psychiatry* (134-158). Hoboken, NJ: John Wiley and Sons.
- Kilpatrick, K. L. (2005). The parental empathy measure: A new approach to assessing child maltreatment risk. *American Journal of Orthopsychiatry*, 75, 608-620. doi: 10.1037/0002-9432.75.4.608

- Kohout, F. J., Berkman, L. F., Evans, D. A., & Cornoini-Huntley, J. (1993). Two shorter forms of the CES-D depression symptoms index. *Journal of Aging and Health, 5*, 179-193.
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review, 20*, 561-592.
- Luyten, P., Mayes, L. C., Nijssens, L., & Fonagy, P. (2017). The parental reflective functioning questionnaire: Development and preliminary validation. *PLOS ONE, 12*, e0176218. doi: 10.1371/journal.pone.0176218.
- MacPhee, D. (1981). *Knowledge of Infant Development Inventory*. Unpublished manual and questionnaire. University of North Carolina, Chapel Hill.
- Niessen, A., & Konrad, K. (2017). Recognizing infants' emotional expressions: Are adolescents less sensitive to infants' cues? *Infant Mental Health Journal, 38*, 451-460. doi: 10.1002/imhj.21651
- Petterson, S. M., & Albers, A. B. (2001). Effects of poverty and maternal depression on early child development. *Child Development, 72*, 1794-1813.
- Shelton, K. K., Frick, P. J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology, 25*, 317-329.
- Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment and Human Development, 7*, 269-281.
- Stern. (2015). *IRI-PE*. Unpublished manual and questionnaire. Maryland Child and Family Development Lab.

- Sue, S. (1999). Science, ethnicity, and bias where have we gone wrong? *American Psychologist*, *54*, 1070-1077.
- Taylor, A., Atkins, R., Kumar, R., Adams, D., & Glover, V. (2005). A new mother-to-infant bonding scale: Links with early maternal mood. *Archives of Women's Mental Health*, *4*, 45-51.
- Tronick, E., & Reck, C. (2009). Infants of depressed mothers. *Harvard Review of Psychiatry*, *17*, 147-156. doi: 10.1080/10673220902899714.
- Vandell, D. L. (1996). Characteristics of infant child care: Factors contributing to positive caregiving. *Early Childhood Research Quarterly*, *11*, 269-306.
- Waytz, A., Gray, K., Epley, N., & Wegner, D. M. (2010). Causes and consequences of mind perception. *Trends in Cognitive Sciences*, *14*, 383-388.
- Weisman, K., Dweck, C. S., & Markman, E. M. (2017). Rethinking people's conceptions of mental life. *Proceedings of the National Academy of Sciences USA*, *43*, 11374-11379.

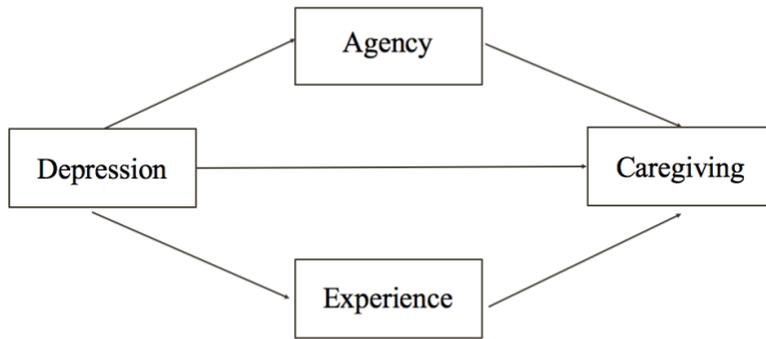


Figure 1. *Mediation model of mind perception on the association of depression and caregiving.*

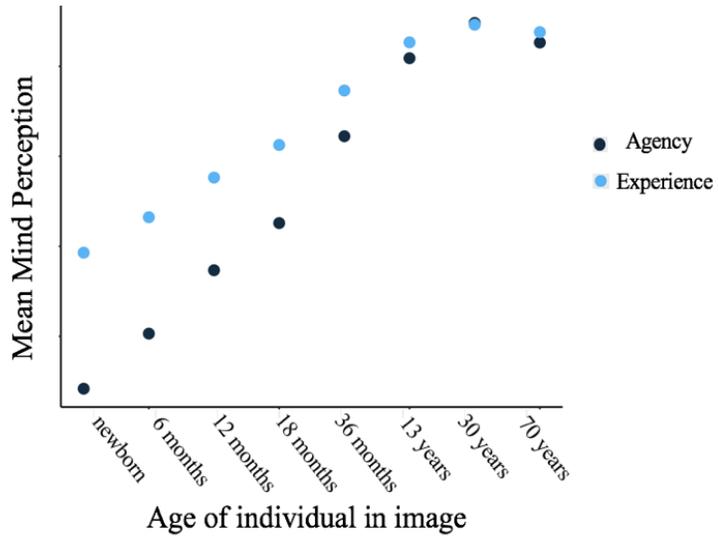


Figure 2. *Change in Mind Perception as a Function of Age and Type of Measure (Agency and Experience).*

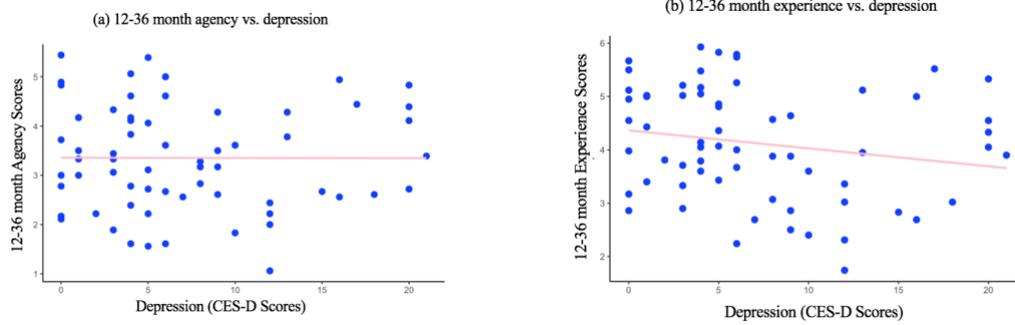


Figure 3. Scatterplots of 12 – 36 month Agency vs. Experience (Panel a) and 12 – 36 month Experience vs. Depression (Panel b)

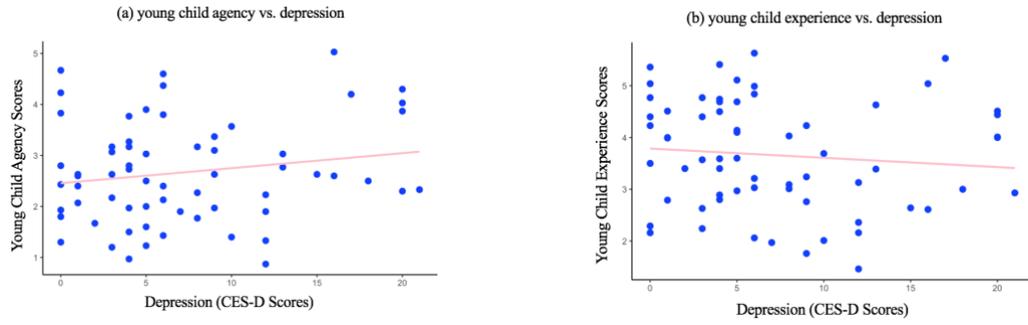


Figure 4. *Scatterplots of Young Child Agency vs. Depression (Panel a) and Young Child Experience vs. Depression (Panel b)*

Table 1.

Multiple Regression Analyses for Punitive Parenting.

Predictor	<i>B</i>	β	R^2	ΔR^2
Block 1			.31*	.31*
Sex	.29	.03		
Age	-.01	-.02		
Race	-4.21	-.44*		
Ethnicity	2.91	.20		
Marital status	1.70	.13		
Education level	1.07	.09		
Block 2			.33*	.02
Agency	.75	.16		

Note. $N = 64$. * $p < .05$.