

Investigating the Relationship Between Maternal Depression, Infant Social and  
Emotional

Development, and Maternal Role Satisfaction

by

Autumn Leif Argent

A Dissertation Presented in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy

Approved April 2024 by the  
Graduate Supervisory Committee:

Elizabeth Reifsnider, Chair  
Katie Hinde  
Michael Todd  
Corrie Whisner

ARIZONA STATE UNIVERSITY

May 2024

## ABSTRACT

Postpartum depression affects approximately 15% of the childbearing population in the United States and has been linked to a number of negative maternal and infant outcomes. Mothers who rate low in areas of confidence and self-efficacy tend to have lower satisfaction and view their infants as having more negative temperaments. Infants of depressed mothers have been found to have delays in social and emotional growth which can impair their health and future developmental outcomes.

The purpose of this study was to determine if there is any evidence to support the hypothesis that maternal depression is associated with infant social and emotional development and maternal role satisfaction among low-income women in rural Arizona. This study employed a repeated measures correlational descriptive prospective longitudinal design using chart reviews analyzing existing clinical data. Purposive sampling was used to select charts of women who participated in the Verde Valley Medical Center branch of the Arizona Healthy Families program. Chart reviews were used to identify charts that met the inclusion criteria of mothers and their infants who completed at least 18 months of the Arizona Healthy Families Program.

Findings of this study indicated evidence of a relationship between depression, infant social and emotional development, and maternal role satisfaction. Mothers who had infants that scored higher, with higher being indicative of concern, on the Ages & Stages Questionnaire: Social-Emotional Edition 2 (ASQ:SE 2) had lower role satisfaction scores on the Healthy Families Parenting Inventory (HFPI) and mothers who indicated dissatisfaction at 6 months postpartum were more likely to continue to indicate lower

maternal satisfaction at 12 and 18 months postpartum when infant ASQ:SE 2 scores were higher.

Investigating the role of the visiting service providers, such as Healthy Families, and their impact on young families for risk identification and resource support will provide information to policy and lawmakers to aid in decisions for funding and help support young families with the goal of growing strong, healthy families in healthcare deserts like rural Arizona.

Keywords: Postpartum depression, maternal depression, infant social and emotional development, maternal role, maternal role satisfaction

## DEDICATION

To my son, Elijah, you are my motivation, my inspiration, and my constant, steady supporter.

## ACKNOWLEDGMENTS

First and foremost, I would like to thank my advisor and mentor, Dr. Elizabeth Reifsnider, who has guided, mentored, and shaped me throughout my tenure in graduate school. I am indebted to your support, guidance, and leadership throughout this whole process. To my esteemed committee, Dr. Michael Todd, Dr. Corrie Whisner, and Dr. Katie Hinde, your persistence and tenacity to see me through to the very end has no bounds and I am eternally thankful. In particular, Dr. Michael Todd, you have been instrumental in helping me navigate the challenges of data analysis for this study. I am grateful for your patience and persistence through the several months long analysis process. I would also like to thank Levi Colton and Christina Watkins who have advised me in navigating the many processes of the graduate program and the Edson College of Nursing and Health Innovation. I want to recognize my peers, Amy Hutchins, Elizabeth Lorenzo, Jason Bradley, Samantha Calvin, and my husband, Paul Fried, who have supported me both in my coursework and outside the classroom, who gave me place to debrief and decompress, and whose friendship has been a respite throughout all the tribulations of graduate school. Finally, I would like to acknowledge my son, Elijah Argent, who has seen the best and worst of me through my graduate studies and been my greatest advocate from the very beginning. Without his faith in me, I would not have had the motivation to finish.

## TABLE OF CONTENTS

|   | Page |
|---|------|
| LIST OF TABLES .....  | viii |
| LIST OF FIGURES.....  | ix   |
| CHAPTER   |      |
| 1 INTRODUCTION .....  | 1    |
| Statement of the Problem.....                                 | 1    |
| Purpose of the Study and Research Questions .....             | 2    |
| 2 REVIEW OF THE LITERATURE.....                               | 3    |
| Maternal Mood Disorders .....                                 | 3    |
| Depression and Infant Social and Emotional Development.....   | 6    |
| Depression, Maternal Role Attainment, and Maternal Role ..... | 11   |
| Theory and Conceptual Model .....                             | 13   |
| Specific Aims and Research Questions .....                    | 17   |
| 3 RESEARCH DESIGN AND METHODS .....                           | 18   |
| Study Design .....  | 18   |
| Sample .....  | 19   |
| Setting.....  | 21   |
| Measures and Procedures.....                                  | 21   |
| Demographic Questions.....                                    | 22   |
| Infant Social and Emotional Development.....                  | 22   |
| Maternal Depression .....                                     | 24   |
| Healthy Families Parenting Inventory .....                    | 24   |

| CHAPTER   | Page |
|---|------|
| Variables and Limitations .....   | 25   |
| Data Analysis .....   | 26   |
| Preliminary Analysis.....   | 26   |
| Statistical Plan .....  | 26   |
| 4 RESULTS .....   | 30   |
| Characteristics of the Sample.....  | 30   |
| Research Question 1.....  | 35   |
| Research Question 2.....  | 36   |
| Research Question 3.....  | 38   |
| 5 DISCUSSION .....  | 41   |
| Depression and Infant Social and Emotional Development.....                   | 41   |
| Depression, Maternal Role Attainment, and Maternal Role Satisfaction .....    | 42   |
| Infant Social and Emotional Development, and Maternal Role Satisfaction ..... | 44   |
| Implications for Practice .....   | 45   |
| Implications for Future Research.....   | 45   |
| Limitations.....  | 46   |
| Conclusion.....   | 47   |
| REFERENCES .....  | 48   |
| APPENDIX  |      |
| A EDINBURG PERINATAL/POSTNATAL DEPRESSION SCALE .....                         | 58   |
| B HEALTHY FAMILY PARENTING INVENTORY .....                                    | 60   |
| C AGES & STAGES QUESTIONNAIRE: SOCIAL-EMOTIONAL EDITION 2 .....               | 66   |

APPENDIX

Page

D IRB EXEMPTION ..... 85



## LIST OF TABLES

| Table   | Page |
|---|------|
| 1. Demographic Characteristics of the Sample .....  | 31   |
| 2. Frequencies and Percentages of the Variables .....   | 34   |
| 3. Means, SD, Pearson Correlations, and Sample Sizes <sup>a</sup> for Maternal Postpartum<br>Depression and Infant and Social and Emotional Development .....                               | 36   |
| 4. Means, SD, Pearson Correlations, and Sample Sizes <sup>a</sup> for Maternal Postpartum<br>Depression and Maternal Role Satisfaction .....  | 37   |
| 5. Means, SD, Pearson Correlations, and Sample Sizes <sup>a</sup> for Infant Social and Emotional<br>Development and Maternal Role Satisfaction at 6, 12, and 18 months<br>Postpartum ..... | 39   |

## LIST OF FIGURES

| Figure |   | Page |
|--------|---|------|
| 1.     | Model of Maternal Role Attainment ..... | 16   |
| 2.     | Milestone Timepoints for Analysis ..... | 27   |

# CHAPTER 1

## INTRODUCTION

### Statement of the Problem

There is a gap in research investigating the links among maternal depression, infant social and emotional development, and maternal role satisfaction amongst rural parenting populations. The dynamics of parenting role satisfaction, maternal depression, and infant social and emotional development are instrumental in early childhood development, and in rural areas are often overlooked both by researchers and lawmakers. Although there are current initiatives aimed at improving access to healthcare in rural settings, residents living in rural areas often face a multitude of challenges in obtaining timely and appropriate care. The Arizona Department of Health Services (ADHS) notes that while 14% of the U.S. population resides in rural settings, upwards of 25% of Arizona residents live in rural areas (ADHS, 2024). Further, 42% of Arizonans live in areas that are federally designated as Health Professional Shortage Areas or Arizona Medically Underserved Areas (AzMUA) and of the 82 AzMUAs, 12 are within tribal areas.

Postpartum depression has been linked to decreased parenting self-efficacy and increases the risk of difficult infant social and emotional development, disturbed infant sleep patterns, and disrupted cognitive, social, and emotional development in infants of depressed mothers (Mollard et al., 2016; Vedova, 2014). The Pregnancy Risk Assessment Monitoring System (PRAMS) data from Arizona in 2020 indicated that 13.9% of participants experienced symptoms of postpartum depression and 29.9% of participants

participated in counseling for depression or anxiety (ADHS.gov, 2024). Few research studies have investigated the impact of postpartum depression in rural areas and fewer programs developed to support this vulnerable population.

### **Purpose of the Study and Research Questions**

The purpose of this study is to examine the associations among maternal depression, infant social and emotional development, and maternal role satisfaction. Using data gathered by the Arizona Healthy Families program, this study will determine if there are any correlations to support the hypothesis that maternal depression impacts infant social and emotional development and maternal role satisfaction. Previous research has shown that maternal mood disorders may impact infant development and is linked with potential changes in parenting self-efficacy; however, less is known about how this research translates in rural populations with limited access to healthcare and mental health services. Using data available from the Arizona Healthy Families Program, the following specific aim and research questions were developed:

SA: Determine the relationship between postpartum depression, infant social and emotional development, and maternal role satisfaction during the first 18 months postpartum.

RQ1: Is early maternal postpartum depression associated with infant social and emotional development?

RQ2: Is early maternal postpartum depression associated with maternal role satisfaction?

RQ3: Are infant social and emotional development and maternal role satisfaction associated at the 6-, 12-, and 18-month time points?

## CHAPTER 2

### REVIEW OF THE LITERATURE

#### Maternal Mood Disorders

Postpartum depression is defined by the Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> edition (DSM 5) as “a major depressive disorder that is identified in pregnancy or within four weeks postpartum” (Langan & Goodbred, 2016). DSM 5 criteria for the diagnosis of postpartum depression falls under the category of major depressive disorders. Symptoms of postpartum depression include, but are not limited to, depressed mood for most of the day nearly every day, marked disinterest or diminished pleasure in activities, weight changes, insomnia or hypersomnia, psychomotor agitation, fatigue, feelings of worthlessness, diminished concentration, and recurrent thoughts of death or suicidal ideation (Langan & Goodbred). In order to meet diagnostic criteria, symptoms must be persistent, cause clinically significant distress, and not be attributed to substance use or other medical conditions (Langan & Goodbred). Risk factors for the development of postpartum depression include psychological, social, and biological components (Suri & Altshuler, 2012). Women with a prior history of mental health disorders such as previous depressive episodes, anxiety, obsessive compulsive disorder, or bipolar disorder are at higher risk for developing postpartum depression (Suri & Altshuler). Postpartum depression has been linked to negative outcomes for both the mother and her infant. Untreated depression poses the highest risk for potential negative impacts and can lead to impaired infant development, delayed speech, cognitive deficits, and behavioral problems (Suri & Altshuler). A review of the literature by Slomian et al.

(2019) found there were significant associations between postpartum depression and infant health, with infants of mothers who experience depression being more likely to suffer from childhood illnesses and colic. Specific findings of their literature review included delayed motor development, impaired language development, more emotional disorders and higher emotional scores, and lower social engagement at nine months (Slomian et al.). Mothers with depression are less likely to bond with their infants and show less sensitivity to infant cues, are less likely to breastfeed and are more likely to discontinue breastfeeding early, have poorer caring practices and more disruptions in caring, and infants of depressed mothers are less likely to obtain routine immunizations or healthcare visits (Slomian et al.). Mothers who are depressed demonstrate less confidence and competence in parenting practices, have fewer social and emotional interactions, and have an overall negative view of her parenting practices and parenting effectiveness (Slomian et al.; Rode & Kiel, 2014).

Pregnancy and postpartum are vulnerable times for women, particularly for women with a history of mental health disorders including, depression and anxiety. The Centers for Disease Control (CDC) data from the Maternal Mortality Review Committees reports that nearly 9% of all maternal deaths are related to mental health conditions (CDC, 2020). Of serious concern is the increasing trend of postpartum depression. In a study based on a large hospital system located in southern California, Getahun et al., (2023) found that the prevalence of postpartum depression is increasing and that, although persistent, the gaps in racial and ethnic disparities could be decreasing. Further research from Do, et al., (2023) found significant increases in postpartum depression

during the 2020 COVID-19 pandemic by 23.7%, compared to prior to the pandemic, and that nearly half of mothers experiencing postpartum depression did not receive treatment for their depression. Further, there is discrepancy between maternal perception of healthcare providers (HCP) asking about postpartum depression versus HCPs statements that they screened for depression. Self-reports from mothers noted that only 12% of mothers were asked about postpartum depression versus reports from HCPs that 87.4% of mothers were asked about depression during postpartum visits (CDC, 2020). Anokye, et al. (2018) noted that 10-15% of mothers experience postpartum depression and that certain life events, such as single parenting, childcare stressors, and prenatal anxiety, are predisposing factors to developing postpartum depression. Further, the American Psychological Association (2022) notes that additional predisposing factors for postpartum depression are first time motherhood, lack of social support, and financial or employment problems.

Research by Ramakrishna et al., (2019) found that mothers who experience comorbid mood disorders of anxiety and depression have the highest scores on the Edinburg Postnatal Depression Screening tool (EPDS) and are less likely to be breastfeeding, have a live in partner, have adequate social support, and are more likely to be unemployed. These mothers had infants that scored lower on the Short Temperament Scale Instrument (STSI) and with sleep and temperament difficulties (Ramakrishna et al.). Challacombe et al. (2016) found that mothers with obsessive compulsive disorder (OCD) were less sensitive and more intrusive across parenting tasks and this is consistent with other research in mothers experiencing postnatal anxiety. Challacombe et al. note

that previous research has found that breastfeeding may offset some of the symptoms of anxiety and increase maternal sensitivity. Since mothers in this study did not or could not breastfeed related to medications they were on or other factors, Challacombe et al. found that this may have contributed indirectly to decreased maternal self-efficacy. It has been found that breastfeeding has protective effects on maternal self-efficacy through both the hormones produced by breastfeeding and the physical interactions and bonding that occur between mother and child during breastfeeding (Challacombe et al.).

### **Depression and Infant Social and Emotional Development**

Infant social and emotional development is comprised of two developmental concepts: temperament and attachment (Malik & Marwaha, 2022). Infant temperament is defined as “an innate attribute that defines the child’s approach to the world and his interaction with the environment” and is comprised of three broad categories: easy or flexible, active or feisty, and slow to warm up or cautious (Malik & Marwaha). Infant social and emotional development is dependent upon the establishment of trust and confidence between the infant and their caregiver during the first year of life. The establishment of this trust and confidence allows for the infant to seek out caregivers in times of stress and is known as attachment (Malik & Marwaha). It is expected that infants follow a specific trajectory in developing socially and emotionally, forming positive attachments, and learning self-regulation. Deviations from this expected trajectory may indicate psychosocial disturbances and later social and emotional developmental issues such as autism, attention deficit disorder, and conduct disorder, among others (Malik & Marwaha).



Goodman et al. (2017) found that women with risk factors for perinatal depression have higher rates of perinatal depression and anxiety. They rate their infant as having higher negative affectivity and may be less able to help their infants regulate stress. Findings from this research suggest that even one clinically significant period of depression during pregnancy was linked to insensitive infant parenting at 12 months of infant age (Goodman et al.) Research by Goodman et al. was important in developing a broader understanding of the impact of any perinatal depression on infant outcome and sensitive parenting during early infant social and emotional development. Findings from Melchior et al. (2012) supported other research findings that infant temperamental difficulties increase with maternal depression and socioeconomic status. Infants of mothers who come from low-income families and families with psychopathological and socioeconomic risks may have an increased incidence of developing issues with temperament and emotionality from early infancy (Melchior et al.). Research by Penacoba et al. (2021) found that there is a significant relationship between postpartum depression and the mother's perception of the infant as being unstable, being less alert, and being more irritable during breastfeeding. Additionally, they found a significant association between postpartum depression and the lack of security in baby care. Penacoba et al. found that avoidant coping, characterized by actions taken to avoid direct contact with the triggering stressor, exacerbated relationships between postpartum depression and the perception of the infant and thoughts of maternal self-efficacy. When maternal avoidant coping was high, postpartum depression was positively associated with

the perception of the baby as being unstable and without an easy temperament (Penacoba et al.).

Seth et al., (2016) performed a systematic review of the literature investigating the links between stress, cortisol production, and maternal depression. Cortisol is a key hormone released in response to stress and additional cortisol is produced by the placenta during pregnancy (Seth et al.). Findings from the literature review indicate that antenatal cortisol production was linked to postpartum “baby blues” and that postnatal cortisol withdrawal after delivery of the placenta was linked with more chronic depressive symptoms (Seth et al.). Grey et al. (2013) found that breastmilk cortisol had a positive association with infant temperament and infant negative affectivity was higher as milk cortisol increased. Increased cortisol in maternal milk was associated with negative reactivity and fearful temperament, increased shyness, and emotionality; however, these associations were only observed in female infants and not in male infants. Hinde et al. (2015) found in primates that milk cortisol was associated with variation in infant temperament between male and female offspring. Changes in temperament were specific to timing of cortisol levels in milk and higher levels of cortisol in early lactation was associated with nervous temperament and peak lactation cortisol levels were associated with lower confidence in female offspring. Male offspring were more sensitive to breastmilk cortisol levels between early and peak lactation and demonstrated negative temperament and lower confidence when cortisol levels were higher between early and peak lactation (Hinde et al.). Kielbratowska et al. (2015) identified gender differences in temperamental traits with boys scoring higher than girls on vigor, adaptability, and

sensitivity. Breastfed infants scored higher on vigor and bottle-fed infants scored higher in regularity. Temperamental traits are related to feeding method, bottle versus breastfed, and mothers who breastfeed are more confident in feeding and perceive their child to be less irritable during feeding. Denis et al. (2012) noted that perception of infants as difficult was a predictor of postpartum blues and there are links between maternal self-esteem and lack of confidence in caretaking and maternal self-confidence.

Hardin et al. (2021) found that mothers who were not depressed showed more affectionate touch during breastfeeding than mothers who were depressed and depressed mothers who breastfeed showed more affectionate touch than depressed mothers who formula feed. Although there were differences in mothers who formula fed versus breastfed, there were no significant differences in depressed versus non-depressed mothers who breastfed in affectionate touch according to the research finding from Hardin et al. Longer duration of breastfeeding was related to more mother and infant affectionate touch across age (Hardin et al.). Feeding method affected outcomes for infants of depressed mothers in the quality of affectionate touch as feeding method affected electroencephalogram (EEG) asymmetry. Infant's 3-month affectionate touch behavior was predicted by breastfeeding, temperament, EEG asymmetry, maternal depression and prior affectionate touch patterns, with breastfeeding having a positive effect on maternal and infant affectionate touch. Maternal depression symptoms and feeding method impact the socio-emotional relationship between mother and infant and the infant's temperamental and neurodevelopmental patterns (Hardin et al.). Mothers who lack appropriate nurturing and protective behaviors, including diminished maternal infant

attachment, have infants with impaired social and emotional development (Li, 2023). Fussy or difficult infant temperament was found to be negatively associated with maternal infant attachment and significant associations between emotional regulation, maternal infant attachment, social and emotional development, and behavioral problems have been demonstrated in research (Li). Diminished sensitivity to infant cues, mental health problems, and withdrawal from the infant may precipitate infant emotional dysregulation and impaired infant social and emotional development (Li). Sørensen et al. (2023) found that maternal anxiety was associated with more difficult infant temperament at 18 month and that infant sex related differences exist in maternal anxiety and maternal depression. Infant girls had increased susceptibility to temperamental issues when mothers were more anxious prenatally and infant boys had increased susceptibility to temperamental issues when mothers were more depressed in the postpartum period. Nieto et al. (2019) found that maternal postpartum depression and maternal anxiety were both linked to difficult infant temperament and this was statistically significant in mothers who had symptoms of prenatal and postnatal depression.

Power et al. (2022) found that numerous factors around childbirth were associated with perceived early infant behavior. Subjective and psychological factors with maternal personality traits predicted perceived infant behavioral style and maternal confidence. Mothers' sense of wellbeing was reflected in higher self-confidence and perceptions of easier infant behavior. Breastfeeding status was associated with less unsettled irregular behavior over the first six months of infant life. Negative maternal emotional states were associated with maternal reports of unsettled irregular infants, as did higher EPDS scores.

Infant temperament, maternal mood, and personality were reciprocally associated. Kim et al. (2020), found that elevated EPDS antenatally, postnatally, or both, was associated with an increased odd of shorter sleep duration, and three of the five dimensions of temperament were significantly associated with antenatal EPDS scores, Children of mothers with high EPDS antenatal scores were 1.3 times more likely to have night awakenings, which is evidence for a mediating pathway from antenatal maternal depression to childhood sleep through infant temperament.

### **Depression, Maternal Role Attainment, and Maternal Role Satisfaction**

Adopting the maternal role is a complicated process that starts during pregnancy and continues throughout the first four to six months postpartum (Mercer 1985). Kordi et al. (2017) state that maternal role attainment consists of four steps: waiting stage, official stage, informal stage, and personal stage. Attainment of the maternal role supports healthy attachments with the infant, increases confidence in maternal role, and increases satisfaction (Kordi et al.). Aktas and Almemdar (2018) investigated the role of maternal fatigue, maternal depression, and maternal insomnia in maternal role and attachment. Their findings indicate that maternal fatigue negatively impacts maternal attachment, maternal self-care power, and breastfeeding self-efficacy. Further, research on fatigue, infant care, and maternal energy expenditure by Ozdemir and Ozcan (2023) found that mothers who have lower self confidence in caring for their infants have a more difficult time transitioning into the role of motherhood. This was impacted by the degree of depression experienced by the mothers, with those who experienced higher levels of depression having greater fatigue and stress and less energy to complete mothering tasks,

which then precipitated guilt and a diminished confidence in obtaining a motherhood role (Ozdemir & Ozcan). Rode and Kiel (2016) found that there is a relationship between infant temperament, maternal depression, and maternal role attainment. Mothers who experience depression tended to have a more negative view of maternal role attainment, have fewer emotional resources, and have avoidant behavior towards their infants.

Abrams and Curran (2011) investigated the perception of maternal role in relation to postpartum depression and poverty. They found that mothers who experience postpartum depression in the setting of poverty experienced more negative views of themselves and felt stigmatized by their socio-economic and mental health situations. Postpartum depression was a stronger mediator as compared to poverty when applied to maternal self-identity and maternal role attainment (Abrams & Curran). Research by Denis et al. (2012) found that mothers who experience postpartum blues and postpartum depression are more likely to lack confidence, have lower self-esteem, and view their infants as more difficult. Further supporting this is research by Puente et al. (2020) that found statistically significant correlations between mother's experience of postpartum depression and a lack of self-efficacy and security in caring for their infant. Postpartum depression was further associated with maternal avoidant coping behaviors and a negative perception of the infant and of the mother's ability to care for the infant (Puente et al.). Ohan et al. (2000) defined parenting self-esteem as the contentment and perceived effectiveness of themselves as a parent. Maternal satisfaction, maternal self-esteem, and maternal confidence is related to parenting styles, and literature notes that parents with negative self-views, lower self-esteem, and/or less parenting confidence rate their infants as more fussy or

difficult and have more attachment issues with their child (Ohan et al.). Kleinman and Reizer (2018) found that maternal self-efficacy is a contributing factor to postpartum depression and that negative self-efficacy results in lowered self-esteem and a negative view of one's role as a mother.

## **Theory and Conceptual Model**

### **Maternal Role Attainment Theory**

Maternal role attainment was developed as a theory based on Reva Rubin's work describing the progressive stages of maternal adaptation to mothering (Mercer, 2004; Rubin, 1976). Rubin's work was based on four concepts; ensuring safe passage, ensuring acceptance, binding-in, and giving of oneself (Rubin, 1976). Ensuring safe passage is demonstrated by the mother in her concern and protectiveness around pregnancy, childbirth and child-rearing. The mother is concerned with and is focused on protecting the child from hidden and obvious dangers (Rubin). Ensuring acceptance is conceptualized by the maternal actions taken to imbue the child with the known family norms, attitudes, values, and behaviors that are significant to the family and society the child will enter (Rubin). Binding-in is demonstrated by the mother through viewing the child as one's own and adopting the view of being the mother of the child (Rubin). Finally, the giving of oneself is actualized by the mother through a sustained giving of time, nurturing, and protection of the child from stressors, whether they are explicit or construed (Rubin). Rubin's work formed the foundation of Mercer's Maternal Role Attainment Theory (Mercer, 2004). The process of maternal role attainment is conceptualized in four stages: anticipatory, formal, informal, and personal identity. These

concepts are based on Mercer's work with Rubin and based on Thornton and Nardi's original role attainment stages (Mercer; Thornton & Nardi, 1975). The core concepts are used to describe the way a new or expecting mother transitions from antenatal to postnatal. Mercer defines the anticipatory stage as the stage that occurs prior to and during pregnancy and encompasses the woman's preparation for a mothering role. The formal stage begins at the birth of the child and is when the woman begins to identify herself as a mother and the child as independent from her physical being. During this stage she moves into the caregiving role, relying on the advice and behaviors as those she deems as "experts" (Mercer). The next phase of maternal transition is the informal stage. During the informal stage the mother moves away from strict adherence to the advice of others and leans into her own judgments on the best way to parent her child. The fourth, and final, stage of maternal role attainment is personal identity. During this stage the mother develops a sense of confidence and harmony with her role as a mother. This stage is characterized by confidence, satisfaction, and infant attachment. Throughout this process there are a multitude of variables that Mercer identified as having an impact on transition from anticipatory to personal identity. Variable such as maternal age, socio-economic status, birth experience, social support and social stressors, health status, infant and maternal personality traits, and even infant appearance all can have an impact on maternal role attainment (Mercer). Mercer noted in her work that mothers were more likely to feel confident and satisfied at 4 month of infant age, but by 8 - 12 months of infant age mothers reported feeling less confident and competent.

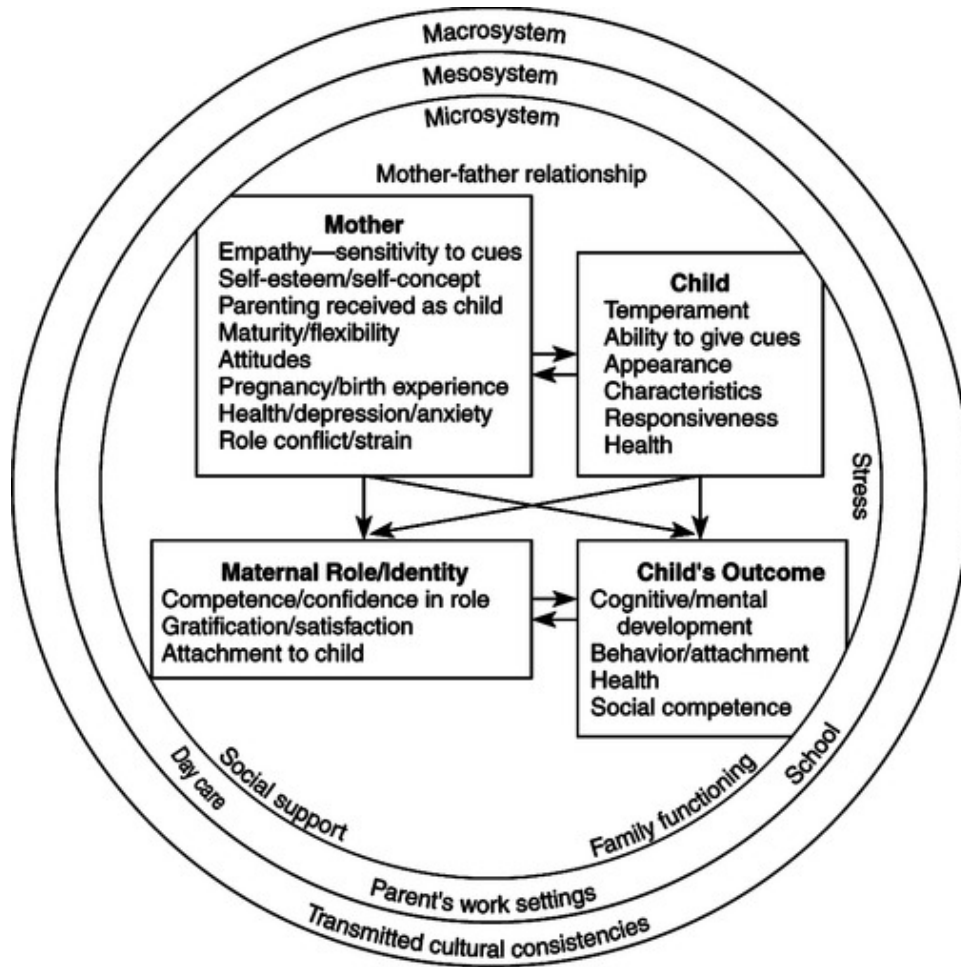


Maternal role attainment offers a theoretical framework for evaluating the impact of postpartum depression on perceptions of infant social and emotional behavior and maternal role satisfaction. Although the focus is on the mother and mother-child relationship, it demonstrates the complicated inter- and intrapersonal processes that contribute to maternal role attainment. Further, for the purposes of this study, it encompasses the interactions between mother and child that are integral to infant and child development which fall under the heading of child's outcome in Figure 1. As depicted in Figure 1, the mother-child feedback loop is comprised of maternal sensitivity, self-concept, attitude, personal history, mental health, and role strain, all of which feed into the child's temperament, appearance, responsiveness, and health. This creates a constant feedback loop between mother and child that can be view as cyclical in nature, rather than linear. The child's outcome is dependent upon this feedback loop and the mother's role or identity as it pertains to the child. All these factors then further feed into the mother's perception of self, or role attainment, her confidence, her satisfaction as a mother, and her attachment to the child. Interpersonal factors such as work, school, extraneous stressors, paternal support, family support, and living situations make up the larger, outer layers of the framework denoting that they have an influencing factor on the mother and child but are not the sole factors contributing to maternal role attainment. Further out are influencing factors such as cultural beliefs, social norms, and the larger societal macrosystems, which may contribute but have less of an overall influence on the mother/child couplet. The conceptual model below lays out the basic tenants of the concept of maternal role attainment. This model was built upon the work of

Bronfenbrenner (1974, 1975, 1994) and adapted by Ramona Mercer (1991) who replaced exosystem with the word mesosystem.

**Figure 1**

*Model of Maternal Role Attainment*



Modified from Mercer, R. T. [1991]. *Maternal role: Models and consequences*.

(Meighan, 2017)

## **Specific Aims and Research Questions**

Using data available from the Arizona Healthy Families Program, the following specific aim and research questions were addressed by examining associations among the study variables:

SA: Determine the relationship between postpartum depression, infant social and emotional development, and maternal role satisfaction during the first 18 months postpartum.

RQ1: Is early maternal postpartum depression associated with infant social and emotional development?

RQ2: Is early maternal postpartum depression associated with maternal role satisfaction?

RQ3: Are infant social and emotional development and maternal role satisfaction associated at the 6-, 12-, and 18-month time points?

## CHAPTER 3

### RESEARCH DESIGN AND METHODS

#### Study Design

This pilot study examined associations among maternal depression, infant social and emotional development, and maternal role satisfaction. The purpose of this study is to determine if there is any evidence to support the hypothesis that maternal depression alters infant social and emotional development and maternal role satisfaction among a sample of mothers in rural Arizona who participate in the Arizona Healthy Families program. This study will employ a repeated measures correlational descriptive prospective longitudinal design using chart reviews; thus it is an analysis of existing clinical data. This pilot study seeks to analyze data collected through home visits by the Verde Valley branch of the Arizona Healthy Families Program on maternal depression scores, infant social and emotional development, and maternal role satisfaction based on the Edinburg Postnatal Depression Screening tool, Ages and Stages Questionnaire: Social and Emotional 2 tool, and the Arizona Healthy Families Parenting Inventory. Since this is a secondary analysis of existing data, there will be no variable manipulation and no intervention planned in this study. As there is still limited understanding of the complex interplay between maternal depression, infant social and emotional development, maternal role satisfaction in rural populations, this study will be the basis for future larger scale prospective and intervention-based studies.

## **Sample**

Purposeful sampling was used to select charts of women who participated in the Verde Valley Medical Center branch of the Arizona Healthy Families program. Healthy Families Arizona is a legislative based, publicly funded home visiting program for families at risk for child neglect or abuse and who meet the inclusion criteria listed below. Between October 1, 2021 and September 30, 2022, Healthy Families Arizona provided service to 3,540 families in 15 counties through 11 different program sites. There are two program branches in Yavapai County, one in Prescott and one in Cottonwood that services the greater Verde Valley. The Verde Valley branch has two home visitors and one supervisor who also conducts family home visits when one or either of the home visiting providers is unavailable. Data is collected at the participants home and then recorded in charts which are stored in the contract office located at Verde Valley Medical Center. Chart reviews were used to identify charts that meet inclusion criteria of mothers and their infants who completed at least 18 months of the Arizona Healthy Families Program. There were no exclusion criteria due to the limited sample size. Data was collected from participant chart between May 2023 and August 2023. Charts from participants that initiated care beginning in 2019 were selected for longitudinal purposes to meet the 18-month timeframe and due to the limited number of completed charts post 2020 COVID-19 pandemic. The Arizona Healthy Families Program was designed to identify and support families who are childbearing and childrearing in Arizona with the goal of supporting families through the first five years of their child's life. Inclusion criteria for referral to the Healthy Families program were:

- Infants must be under three months of age at the time of enrollment.
- Parents who are experiencing any of the following stressors: poverty, unemployment, lack of prenatal care, low birth weight of the enrolled child, single or teen parenting, children with special needs or disabilities, history of abuse or child neglect, social isolation, substance abuse, history of intimate partner violence, or mental health concerns such as postpartum depression.
- Mothers who score nine or greater on the EPDS are automatically referred to a Healthy Families home visiting program in Verde Valley Arizona.

This sample was selected without exclusions with the understanding that their scores on the EPDS, ASQ:SE 2, and HFPI may not be reflective of the general population due to their specific inclusion factors, i.e., low socio-economic status, higher proportion of referrals for elevated EPDS scores, history of social issues including Child Protective Service referrals or history of Intimate Partner Violence, or lack of stable housing.

Based on charts reviewed a total of 35 participants met inclusion criteria for completing at least 18 months of the Healthy Families Verde Valley program. Of those 35 participants, 29 met all milestone timeframes for data collection, early EPDS, ASQ:SE 2 at 6, 12, and 18 months, and HFPI at 6, 12, and 18 months. Milestone timepoints were set for each timeframe for collection as follows:

- Birth or day 0: 10 days prepartum to 30 days postpartum
- 6 months: 154-212 days postpartum
- 12 months: 336-394 days postpartum
- 18 months: 519-577 days postpartum

These timeframes were identified to most closely match key developmental milestones while allowing for some variation in collection time due to home visiting schedules and the impact of visiting restrictions during the COVID-19 pandemic. Figure 2 depicts the milestone timeline with associated n of responses for each milestone timepoint, birth to 1 month, 6 months, 12 months, and 18 months for each measurement tool.

### **Setting**

The investigator was on the advisory board of the Verde Valley branch of the Arizona Healthy Families Program and obtained permission from the program director to access charts for review. Charts were identified through the Verde Valley Medical Center section of Health Families. Eligible charts were identified in collaboration with the staff who specifically work with the patient population that has delivered at Verde Valley Medical Center. All participants who were visited by this branch of the Healthy Families program previously delivered at Verde Valley Medical Center. Chart reviews were blinded to ensure patient confidentiality and data will be stored onsite at the Health Families location at Verde Valley Medical Center. No data was accessed until human subjects exemption was received from the IRB at Arizona State University and permission was granted by the program director for the Verde Valley branch of the Arizona Healthy Families Program and the department director of Maternal Child Health at Verde Valley Medical Center.

### **Measures and Procedures**

The following data were collected during Health Families visits by Healthy Family Program Staff:

- Ages and Stages Questionnaire 3 and Ages and Stages Questionnaire : Social and Emotional 2 (at 6, 12, and 18 months of infant age)
- Edinburgh Postnatal Depression Screening (2 days post-delivery)
- Healthy Family Parenting Inventory (at 6, 12, and 18 months of infant age)

## **Measures**

**Demographic Information.** Eight demographic questions were included in the data collection to assess the social and economic characteristics of the sample. Questions about maternal characteristics included relationship status (married, single, not disclosed), ethnicity (Hispanic, white, multiracial, not disclosed), infant gender (male, female, not disclosed), living situation (rents, owns, living with family, not disclosed), food insecurity (yes, no), employment (employed, full time, part time, not employed, not employed-student, not disclosed), insurance type (Medicaid only, none, private and Medicaid, private only), and income (\$0-\$5,000, \$5,001-\$10,000, \$10,001-\$15,000, \$15,001-\$20,000, \$20,001-\$25,000, \$25,001-\$30,000, and \$30,001+).

**Infant social and emotional development.** Infant social and emotional development were assessed using data from the Ages and Stages Questionnaire 3 and Ages and Stages Questionnaire: Social and Emotional 2 (ASQ:SE-2). Both questionnaires include screening for social and emotional behaviors. The ASQ:SE-2 assesses seven behavioral areas: self-regulation, compliance, social-communication, adaptive functioning, autonomy, affect, and interaction with people. “Using ASQ:SE-2 *in addition to* ASQ-3 gives parents and programs a much more thorough understanding of social and emotional behaviors than they’d get from ASQ-3 alone” (Agesandstages.com,



2015). “Social-emotional development is foundational—in order to be successful learners, children need to get along well with others and they also need to feel good about themselves and excited about the world around them” (Clifford, et al., 2015). ASQ:SE-2 has an internal consistency that ranges from 71%-91%, test-retest reliability at 89%, overall validity of 84%, and sensitivity and specificity at 81% and 83%, respectively; Cronbach’s alpha for reliability ranges from .71 at 2 months to .9 at 60 months with an overall value of .84 (Agesandstages.com, 2015). Validity was assessed through a two-step process, initial scores were identified then compared with score the child received on the Devereux Early Childhood Assessment for Infants and Toddlers (DECA-I/T), the Infant Toddler Social Emotional Assessment (ITSEA), Child Behavior Checklist (CBCL), and professional diagnosis of a social and emotional disability (Squires et al., 2015). Scores for the ASQ:SE are measured based on a 23-, 27-, 31-question evaluation for infant ages 6, 12, and 18 months, respectively. Infants are scored based on the evaluation questions. Scores at the 6-month timeframe range from 0 to  $\geq 45$ , with scores between 30-45 indicating the infant requires monitoring for the development of social and emotional concerns and scores  $\geq 45$  indicating the need for referral. Scores at the 12-month timeframe range from 0 to  $\geq 50$ , with scores between 40 and 50 indicating that the infant requires further monitoring and scores  $\geq 50$  indicating the need for referral. Scores at the 18-month timeframe range from 0 to  $\geq 65$ , with scores between 50 and 65 indicating that the infant requires further monitoring and scores  $\geq 65$  indicating the need for referral. Scores that indicate areas of concern and the need for referral or further evaluation and were selected for this study were 45, 50, and 65 at 6, 12, and 18 months, respectively.

**Maternal depression.** The Edinburgh Postnatal Depression Scale (EPDS) was used to assess maternal depression. The EPDS is a 10-question, self-rated assessment scale used to assess for postnatal depression. Developed in 1987, the EPDS has been widely implemented in clinical settings across the United States and in Australia and is considered to be a valid measurement tool when scoring is in the 9/10 range (Gibson et al., 2009). Kernot et al., (2014) found a high rate of agreement in test, re-test of the EPDS among women at low, moderate, and high risk for postnatal depression. They found a high rate of agreement (90.7%), with a Cohen's Kappa of 0.61 (Kernot, et al.). Cox et al. (1987) found that sensitivity of the EPDS was 85%, specificity was 77%, and the positive predictive value was 83% at re-test. In a review of the literature by Park and Kim (2021), they found that:

The sensitivity (of the EPDS) ranged from 0.56 to 1.00 and the specificity ranged from 0.54 to 0.99. In meta-analysis, pooled sensitivity and specificity were 0.79 (95% CI 0.74–0.84) and 0.88 (95% CI 0.82–0.92), respectively, with RE correlation of -0.506, sROC AUC\*\* of 0.89 (SE=0.02), and Q\* value of 0.82 (SE=0.02).

For this study population a score of nine or greater was considered as the cutoff score for concern as this score was included in the referral process to the Healthy Families Program, in which the participants were enrolled.

**Healthy Families Parenting Inventory.** The Healthy Families Parenting Inventory (HFPI) was used to assess maternal role satisfaction. The HFPI is a 63-question, self-report instrument used to assess nine parenting domains: Social Support,

Problem-Solving, Depression, Personal Care, Mobilizing Resources, Role Satisfaction, Parent/child Interaction, Home Environment and Parenting Efficacy (LecroyMilligan.com, 2019). Krysik and Lecroy (2012) found the HFPI subscales to have good to excellent reliability with estimates of Cronbach's alpha ranging from a low of .76 to a high of .92 using. The authors of the tool expect to improve upon the internal consistency of the subscales of the tool with continued revisions (Krysik & Lecroy, 2012). Scores of concern for each domain are as follows: Social Support 17 or lower, Problem-Solving 19 or lower, Depression 33 or lower, Personal Care 16 or lower, Mobilizing Resources 18 or lower, Role Satisfaction 21 or lower, Parent/child Interaction 40 or lower, Home Environment 33 or lower, and Parenting Efficacy 22 or lower. As the aims of this study include understanding associations among maternal depression, infant social and emotional development, and maternal role satisfaction, only role satisfaction scores will be included in analysis. All other data is housed at the storage site at the Healthy Families Program at Verde Valley Medical Center and analysis of additional variables could provide information for future studies.

### **Variables and Limitations**

Variables for this study include maternal depression, infant social and emotional development, and maternal role satisfaction.

Limitations include lack of objective measure for infant social and emotional development, subjective nature of maternal reporting of infant social and emotional development, possible bias in home visitor assessment of maternal-infant interaction, nature of self-reporting, nature of home visiting, and potential attrition. Additional

limitations include small sample size that is homogenous, low income, and have a generally unstable living situation. As data is collected, information that is gathered may reveal additional, extraneous variables which may impact internal validity and be a limitation for this study.

Potential sources of bias within this study include selection bias due to the homogeneity required by the home visitor, maturation bias if patients deliver early or relocate during the study, and observational bias related to the home visitor, which could be related to maternal “best-behavior” or researcher subjective bias. Potential bias from observation bias at any observation intervals will be addressed by confirming inter-rater reliability with another Maternal Child Health expert. Consistent practice in follow up calling and ensuring that home visitor keeps assigned appointment times can help reduce bias due to relocation and attrition.

Finally, as there are other areas of the HFPI that were not included in this study but that may have an impact on the study variables, the investigator acknowledges that this is an additional limitation on this pilot study.

## **Data Analysis**

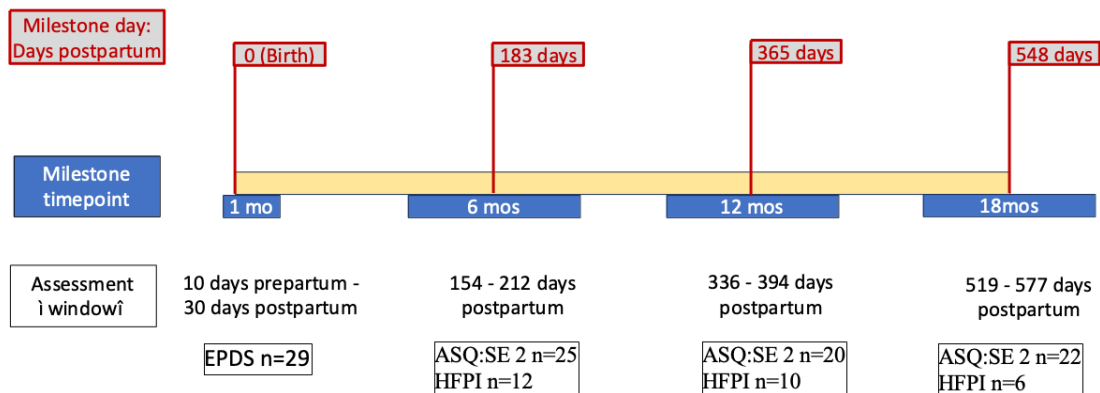
**Preliminary analyses.** Preliminary analyses checked for out of range and logically impossible values and for patterns of missing data.

**Statistical Analysis.** Each participant’s data as collected during home visits were transcribed to text files in Microsoft Word and then transcribed and organized in spreadsheets using Microsoft Excel. Further data organization, subsequent data cleaning, and data coding were performed using R version 4.3. A key coding step was the

assignment of observations to selected developmental milestone time points. First, the difference (in days) between the child's date of birth and the date of each assessment was computed. Each observation was then assigned a specific milestone time point (0 to 1 month, 6 months, 12 months, or 18 months) based on the value of this difference. Because assessments rarely fell exactly on the actual day corresponding to the milestone (e.g., 183 days postpartum for the 6 months milestone), assessment "windows" were constructed to capture the 29 days on either side of the milestone day. For example, the 6 months assessment window started 154 days postpartum (i.e., 183 days – 29 days) and ended 212 days postpartum (183 days + 29 days). Assessments falling within these windows were assigned to the corresponding milestone time point (see Figure 2 for details). When multiple assessments of the same variable fell within the same assessment window, the assessment closest to the milestone day was assigned to the time point. Cleaned data were then exported from R to SPSS (.sav) data files for analysis. All analyses described below were performed in the Statistical Package for Social Sciences (SPSS) version 29.0.2.0.

**Figure 2**

*Milestone Timepoints for Analysis*



First, EPDS scores were examined to determine the proportion of participants who scored 9 or more on the EPDS. An EPDS score of 9 or higher is interpreted as “depression is possible” and at a score of 9 or greater referral to the primary care provider is recommended (Cox et al., 1987).

Next, ASQ:SE 2 scores were examined to determine the proportion of participants reporting scores above age-specific cutoffs. ASQ:SE 2 scores above 45, 50, and 60, at 6, 12, and 18 months of age, respectively, indicate social and emotional delays and the need for further intervention.

To address RQ1 (Is early maternal postpartum depression associated with infant social and emotional development?), prospective associations between early EPDS scores (i.e., from an assessment within 1 month of the child’s birth) and ASQ:SE 2 scores at 6, 12, and 18 months of child age were estimated using Pearson correlation coefficients.

To address RQ2 (Is early maternal postpartum depression associated with maternal role satisfaction?), prospective associations between early EPDS scores and HFPI role satisfaction scores at 6, 12, and 18 months of child age were also estimated using Pearson correlation coefficients.

Finally, to address RQ3 (Is infant social and emotional development associated with maternal role satisfaction?), cross-sectional and prospective associations between ASQ:SE 2 scores and HFPI role satisfaction scores at 6, 12, and 18 months of child age were estimated using Pearson correlation coefficients. Due to the limited sample sizes available for analyses, interpretation of the findings focuses on the magnitudes of associations rather than on tests of statistical significance. Correlations with absolute values of .50 or greater (i.e.,  $|r| \geq .50$ ) are considered to be strong, correlations with absolute values between .30 and .50 are considered to be moderate, and correlations less than .30 are considered to be weak.

## CHAPTER 4

### RESULTS

#### Characteristics of the Sample

A total of 29 mothers and their infants were included in this study. Of the study participants, 41% were married, 37.9% reported they were single, and 20.7% declined to state relationship status. Of the participants 62.1% had a female infant, 34.5% had a male infant, and 3.4% did not disclose the gender of their infant. In regard to ethnicity, 69% of the participants were Hispanic, 24.1% were white, and 3.4% were multiracial. Most participants were covered by the Arizona Healthcare Cost Containment system (AHCCCS) at 69%, and only 10% or 3 participants had private insurance. Of the sample population, 13.8% were employed, 31% were employed full-time, 37.9% were not employed, 3.4% were a student, 13.8% were employed part-time, and 3.4% was undisclosed. Of the sample population 13.6% reported living with a family member, 58.9% rented, 24.1% owned their home, and 3.4% declined to disclose their living situation. A total of 20.5% reported an income above the Federal Poverty Guideline of \$24,860, (Healthcare.gov, 2023), and the remaining 76.1% reported an income of less than \$25,000 or declined to report their income.

Data from Yavapai County, where the greater Verde Valley is located and the area in which the sample population resides and participates in the Healthy Families Program, denotes the following population characteristics. According to the 2022 US Census Bureau Statistics, there were a total of 110,928 households within Yavapai county (U.S. Census Bureau, n.d.). Of these households 52.1% were married, 7.2% were



cohabitating, 21% were single, 56.9% are white, 42.8% are Hispanic, 36.7% are two or more races, and 46% of females aged 16 and over are in the workforce (U.S. Census Bureau). Of those aged 18-34, 20.3% fell below the poverty level, 15% of those with households with a child five or under were below the poverty level, 11.3% of white households, 17.2% of Hispanic households, and 18.6% of multiracial households fell below the poverty level (U.S. Census Bureau). When compared to the U.S. Census data for Yavapai County, participants in the Healthy Families Program are more likely be Hispanic in ethnicity, lower in socio-economic status, and more likely to rent than own their homes. They are also less likely to be married and more likely to be unemployed.

**Table 1**

*Demographic characteristics of the sample (n=29)*

| <u>Variables</u>                | <u>n</u> | <u>Percent</u> |
|---------------------------------|----------|----------------|
| <hr/> Relationship Status <hr/> |          |                |
| Married                         | 12       | 41.4           |
| Single                          | 11       | 37.9           |
| Not disclosed                   | 6        | 20.7           |
| <hr/> Employment Status <hr/>   |          |                |
| Employed                        | 4        | 13.8           |
| Full time                       | 9        | 31.0           |
| Not employed                    | 11       | 37.9           |
| Not employed, student           | 1        | 3.4            |

|               |   |      |
|---------------|---|------|
| Part time     | 4 | 13.8 |
| Not Disclosed | 1 | 3.4  |

---

Living Situation

|                          |    |      |
|--------------------------|----|------|
| Lives with family member | 5  | 13.6 |
| Not disclosed            | 1  | 3.4  |
| Owens                    | 8  | 24.1 |
| Rents                    | 15 | 58.9 |

---

Insurance Status

|                      |    |      |
|----------------------|----|------|
| Medicaid only        | 22 | 75.8 |
| None                 | 3  | 10.3 |
| Private and Medicaid | 1  | 3.4  |
| Private only         | 3  | 10.3 |

---

Child Gender

|               |    |      |
|---------------|----|------|
| Female        | 18 | 62.1 |
| Male          | 10 | 34.5 |
| Not Disclosed | 1  | 3.4  |

---

Ethnicity

|          |    |      |
|----------|----|------|
| Hispanic | 20 | 69.1 |
|----------|----|------|

|               |   |      |
|---------------|---|------|
| White         | 7 | 24.1 |
| Multiracial   | 1 | 3.4  |
| Not disclosed | 1 | 3.4  |
| <hr/>         |   |      |
| Income        |   |      |
| 0-5,000       | 5 | 17.2 |
| 5,001-10,000  | 3 | 10.3 |
| 10,001-15,000 | 4 | 13.7 |
| 15,001-20,000 | 5 | 17.1 |
| 20,001-25,000 | 5 | 17.1 |
| 25,001-30,000 | 3 | 10.3 |
| 30,001+       | 3 | 10.2 |
| Missing       | 1 | 3.4  |

Of the 22 mothers who provided a valid score for the EPDS at the 0–1-month milestone, seven (31.8%) reported an EPDS score of nine or higher. ASQ:SE 2 scores at 6-, 12-, and 18- months were evaluated for scores above 45, 50, and 65, respectively. Of the 25 mothers with valid ASQ:SE 2 scores at 6 months of infant age, none reported a score above 45. Of the 18 mothers with valid ASQ:SE 2 scores at 12 months of infant age two (11.1%) reported a score of 50 or higher. Of the 21 mothers with valid ASQ:SE 2 scores at 18 months of infant age, one (4.8%) reported a score of 65 or higher. HFPI scores were evaluated at 6-, 12-, and 18-months postpartum. Scores below 21 are

considered concerning, and of the 11 mothers with valid scores at 6 months postpartum, one (9.1%) scored 21 or lower. Of the 10 mothers with valid HFPI scores at 12 months postpartum, none reported a score of 21 or lower. Of the 5 mothers who had valid HFPI scores at 18 months, one (20%) reported a score of 21 or lower. All values are reflected in Table 2.

**Table 2**

*Frequencies and percentages of the variables*

| Variable  | n of valid scores* | n ( % meeting clinical threshold) |
|---|--------------------|-----------------------------------|
| EPDS at 1 month postpartum<br>Score 9 or greater indicate area of concern | 22                 | 7 (31.8)                          |
| ASQ:SE 2 at 6 months<br>Score of 45 or greater indicate area of concern   | 25                 | 0 (0.0)                           |
| ASQ:SE 2 at 12 months<br>Score of 50 or greater indicate area of concern  | 18                 | 2 (11.1)                          |
| ASQ:SE 2 at 18 months<br>Score of 65 or greater indicate area of concern  | 21                 | 1 (4.8)                           |
| HFPI at 6 months<br>Score of 21 or less indicate area of concern          | 11                 | 1 (9.1)                           |
| HFPI at 12 months<br>Score of 21 or less indicate area of concern         | 10                 | 0 (0.0)                           |
| HFPI at 18 months<br>Score of 21 or less indicate area of concern         | 5                  | 1 (20)                            |

\*Full sample comprised of 35 participants, 29 included in analytical sample, six excluded due to lack of consistent data across the timelines.

The primary aims of this study were to examine (a) associations of early postpartum depression with subsequent infant social and emotional development (RQ1),

(b) associations of early postpartum depression with subsequent maternal role satisfaction (RQ2), and (c) associations among infant social and emotional development and maternal role satisfaction (RQ3). EPDS scores from within the first month of the child's birth, ASQ:SE 2 scores at 6 months, 12 months, and 18 months, and HFPI role satisfactions scores at 6 months, 12 months, and 18 months were used in the analyses reported below. Not all participants provided responses to each variable at each time point. In the tables below, the number of valid responses for each variable are indicated in the column labeled "n of valid responses" and the number of responses used to compute each correlation is given in parenthesis below the correlation coefficient. For example, although a total of 25 participants responded to the ASQ:SE 2 at 6 months of infant age, only 14 of those same respondents had an early (1-month) EPDS score—this pairwise sample size appears in parenthesis below the corresponding correlation.

**Research Question 1:** Is early maternal postpartum depression associated infant social and emotional development?

Results indicate that there is no association between early EPDS scores and infant social and emotional development at 6 months of age ( $r = .12, p = .69$ ), but there is a moderate association between early EPDS scores and infant social and emotional development at 12 months of age ( $r = .45, p = .11$ ), and a weak association between early EPDS scores and infant social and emotional development at 18 months of age ( $r = .30, p = .29$ ). Findings did indicate a strong and significant positive correlation between infant social and emotional development at 6 months and 12 months of age ( $r = .69, p < .01$ ) and a moderate association between infant social and emotional development at 6 months

of age and 18 months of age ( $r = .41, p = .00$ ). There was also a moderate correlation between infant social and emotional development at 12 months of age and 18 months of age ( $r = .48, p = .08$ ). Correlations between early EPDS scores and infant social and emotional development at 6-months, 12-months, and 18-months of infant age were estimated and the findings are summarized in Table 3.

**Table 3**

*Means, Standard Deviations, Pearson Correlations, and Sample Sizes<sup>a</sup> for Maternal Postpartum Depression and Infant and Social and Emotional Development*

| Variable             | n of valid responses | <i>M</i> | <i>SD</i> | 1           | 2             | 3           |
|----------------------|----------------------|----------|-----------|-------------|---------------|-------------|
| 1. EPDS at 1 mo      | 22                   | 7.8      | 6.2       | –           |               |             |
| 2. ASQ:SE 2 at 6mos  | 25                   | 12.2     | 11.6      | .12<br>(14) | –             |             |
| 3. ASQ:SE 2 at 12mos | 18                   | 18.9     | 20.0      | .45<br>(14) | .69**<br>(15) | –           |
| 4. ASQ:SE 2 at 18mos | 21                   | 18.1     | 29.3      | .30<br>(14) | .41<br>(19)   | .48<br>(14) |

<sup>a</sup>Pairwise sample sizes are presented in parentheses beneath their corresponding correlation coefficients.

Abbreviations:

ASQ:SE 2 = Ages and Stages Questionnaire: Social and Emotional 2

EPDS: Edinburgh Postnatal Depression Scale

HFPI: Healthy Families Parenting Inventory

\*\*  $p < .01$

**Research Question 2:** Is early maternal postpartum depression associated with maternal role satisfaction?

The findings summarized in Table 4 indicate that there were only weak negative associations between EPDS scores at the one-month timeframe and HFPI scores at 6 and 12 months postpartum ( $r = -.18, p = .63$  and  $r = -.24, p = .61$ , respectively). There was a moderate negative association ( $r = -.46, p = .69$ ) for HFPI role satisfaction at 6 months predicting HFPI role satisfaction at 18 months. Other cross-time point associations between role satisfaction scores were weak ( $|r|s < .30$ ). These findings indicate that early maternal depression did not strongly predict maternal role satisfaction across the 0 to 18 months postpartum timeframe. However, early maternal role satisfaction at 6 months was moderately negatively associated with later role satisfaction at 18 months postpartum.

**Table 4**

*Means, Standard Deviations, Pearson Correlations, and Sample Sizes<sup>a</sup> for Maternal Postpartum Depression and Maternal Role Satisfaction*

| Variable                               | <i>n</i> of valid responses | <i>M</i> | <i>SD</i> | 1                     | 2           | 3           |
|--|-----------------------------|----------|-----------|-----------------------|-------------|-------------|
| 1. EPDS at 01 month                    | 22                          | 7.8      | 6.2       | –                     |             |             |
| 2. HFPI role satisfaction at 6 months  | 11                          | 28.2     | 3.0       | -.18<br>(9)           | –           |             |
| 3. HFPI role satisfaction at 12 months | 10                          | 27.6     | 2.0       | -.24<br>(7)           | .29<br>(7)  | –           |
| 4. HFPI role satisfaction at 18 months | 5                           | 25.6     | 8.7       | – <sup>b</sup><br>(2) | -.46<br>(3) | -.29<br>(4) |

<sup>a</sup>Pairwise sample sizes are presented in parentheses beneath their corresponding correlation coefficients.

<sup>b</sup>Could not be computed due to one of the variables being a constant.

Abbreviations:

ASQ:SE 2 = Ages and Stages Questionnaire: Social and Emotional 2  
EPDS: Edinburgh Postnatal Depression Scale  
HFPI: Healthy Families Parenting Inventory

**Research Question 3:** Is infant social and emotional development associated with maternal role satisfaction?

Findings indicate a significant negative correlation between HFPI maternal role satisfaction scores at 6 months postpartum and ASQ:SE 2 scores at 6 months of infant age ( $r = -.65, p < .04$ ). Maternal role satisfaction showed a weak association at 12 months postpartum and 12 months of infant age ( $r = -.22, p = .57$ ). Maternal role satisfaction and ASQ:SE 2 showed a strong positive association with infant ASQ:SE 2 scores at 18 months postpartum and 18 months of infant age ( $r = .80, p = .19$ ). This may indicate that maternal mood and infant social and emotional development had stabilized by 18 months postpartum. However, maternal role satisfaction scores tended to trend negatively at 18-months postpartum when compared to 6 month and 12-month HFPI role satisfaction scores, ( $r = -.46, p = .69, r = -.28, p = .71$ , respectively) indicating that mothers who reported relatively higher dissatisfaction at 6 and 12 months postpartum, were more likely to report lower role satisfaction at 18-months postpartum. Correlations among infant social and emotional development scores at 6, 12, and 18 months of infant age and HFPI maternal role satisfaction at 6, 12, and 18 months of infant age were estimated. The findings are summarized in Table 5.



**Table 5**

*Means, Standard Deviations, Pearson Correlations, and Sample Sizes<sup>a</sup> for Infant Social and Emotional Development and Maternal Role Satisfaction at 6, 12, and 18 months Postpartum*

| Variable                               | <i>n</i> of valid responses | <i>M</i> | <i>SD</i> | 1             | 2           | 3           | 4           | 5           |
|--|-----------------------------|----------|-----------|---------------|-------------|-------------|-------------|-------------|
| 1. ASQ:SE 2 at 6mo                     | 25                          | 12.2     | 11.6      | –             |             |             |             |             |
| 2. ASQ:SE 2 at 12mo                    | 18                          | 18.9     | 20.0      | .69**<br>(15) | –           |             |             |             |
| 3. ASQ:SE 2 at 18mo                    | 21                          | 18.1     | 29.3      | .41<br>(19)   | .48<br>(14) | –           |             |             |
| 4. HFPI role satisfaction at 6 months  | 11                          | 28.2     | 3.0       | -.65*<br>(10) | -.75<br>(7) | .09<br>(9)  | –           |             |
| 5. HFPI role satisfaction at 12 months | 5                           | 27.6     | 2.0       | -.29<br>(8)   | -.22<br>(9) | -.45<br>(8) | .29<br>(7)  | –           |
| 6. HFPI role satisfaction at 18 months | 10                          | 25.6     | 8.7       | .69<br>(4)    | .66<br>(3)  | .80<br>(4)  | -.46<br>(3) | -.29<br>(4) |

<sup>a</sup>Pairwise sample sizes are presented in parentheses beneath their corresponding correlation coefficients.

\*  $p < .05$  (2-tailed).

\*\*  $p < .01$  (2-tailed).

Abbreviations:

ASQ:SE 2 = Ages and Stages Questionnaire: Social and Emotional 2

EPDS: Edinburgh Postnatal Depression Scale

HFPI: Healthy Families Parenting Inventory

## **CHAPTER 5**

### **DISCUSSION**

The findings from this study will be discussed in relation to the three studied concepts: postpartum depression, infant social and emotional development, and maternal role satisfaction. Postpartum depression has been found to be a contributory factor in other research to infant social and emotional development and maternal role satisfaction (Denis et al., 2012; Puente et al., 2020; Rode & Kiel, 2014; Slomian et al., 2019; Suri & Altshuler, 2012)).

#### **Depression and Infant Social and Emotional Development**

In this study, seven of the 29 participants reported an EPDS score of nine or greater at the one-month baseline. Nationally, about one in seven, or about 15%, of women suffer from postpartum depression (Mughal et al., 2022). In this study 24% of participants scored at levels on the EPDS that indicated they were at risk for or may have symptoms of postpartum depression. This data indicates that women in the Verde Valley branch of the Healthy Families Program are more likely to suffer from postpartum depression when compared to national statistics. Risk factors for the development of postpartum depression are previous mental health diagnosis, stressful life events at or around the time of delivery, history of intimate partner violence, medical complications of the mother or the child at or around the time of delivery, lack of social support, having a “challenging child”, and financial or employment problems (American Psychological Association, 2022). Of the study population, 37.9% reported being single as their relationship status. This indicates that these mothers may lack the adequate social support

and resources to help them navigate the many steps and milestones that occur within the first 18 months of their child's life and this lack of social support could be a contributing factor to the higher reported rate of depression among these mothers. Further, 37.9% of the participants stated they were unemployed and 79.5% stated they had an income level below \$25,000 annually. Employment concerns and poverty are both contributors to the risk factors for developing postpartum depression. Although the study did not indicate a correlation between depression scores, based on the EPDS, and infant social and emotional developmental scores, based on the ASQ:SE 2, at 6 months of infant age, results did indicate a correlation between the EPDS score and the ASQ:SE 2 scores at 12 months and 18 months of age. Additionally, the findings indicate that there is a correlation between the 6 month ASQ:SE 2 and the 12 month ASQ:SE 2 indicating that infants who have issues in social and emotional development will demonstrate those behaviors as early as 6 months of age and those behaviors will persist into the first year of life. Findings from Porter et al. (2019) found that mothers who reported higher levels of anxiety and depression across the first year of their infant's life also reported more negative social and emotional behaviors from their infant. The findings of this study at the 12- and 18-month timeframes of analysis further add to the work by Porter et al. by providing some evidence, trending towards significance ( $p < .01$ ) that these negative social and emotional behaviors may persist beyond the first year of life.

### **Depression, Maternal Role Attainment, and Maternal Role Satisfaction**

Rubin wrote extensively on maternal role and the experiences of motherhood. Her work on maternal role attainment and maternal role satisfaction is the basis of the

conceptual model used for this study. Rubin (1984) noted that motherhood is a time of role learning and growing in the maternal role and that disparity between the idealized version of motherhood and actual motherhood can lead to self-disparagement, hopelessness, and despair, which can then become depression (Rubin, 1984, p. 110). Ramona Mercer built upon the work of Rubin and developed the theory of Maternal Role Attainment (2004). Mercer identified several variables as influencing factors in maternal role attainment, namely socio-economic status, social stress, social support, self-concept, role strain, and health status. Participants in this study identified having many of the influencing factors noted by Mercer as possible impedances to maternal role attainment such as poverty, lack of social support, dependence on publicly funded health insurance, and unemployment. Participants in the study were more likely to fall below the Federal Poverty Lines be unemployed, be single and 75.8% were on Medicaid and 10.3% were uninsured. However, in this study postpartum depression was not an indicator of maternal role satisfaction, but early maternal satisfaction was associated with longer-term role satisfaction. Mothers who expressed role satisfaction at 6 months postpartum were more likely to indicate role satisfaction at 18 months postpartum. In a study by Julian et al. (2021), maternal confidence and control were contributing factors to moderating the effects of maternal depression. As this study took place in a rural population with women who face disparity and adversity simply by living in a “healthcare desert” (ADHS, 2022), it may be that their confidence and resilience play a role in mitigating the previously noted effects of depression on maternal role satisfaction. This was not addressed in this study but would be an area for future research within this population.

## **Infant Social and Emotional Development, and Maternal Role Satisfaction**

Analyses addressing Research Question 3 did show evidence of a relationship between infant social and emotional development and maternal role satisfaction. Findings indicated that mothers who had infants that scored higher, with higher being indicative of concern, on the ASQ:SE 2 had lower role satisfaction scores on the Healthy Families Parenting Inventory (HFPI). Mothers who indicated dissatisfaction at 6 months postpartum were more likely to continue to indicate lower maternal satisfaction at 12- and 18-months postpartum when infant ASQ:SE 2 scores were higher. Similar to findings in Leerkes and Crockenberg (2002), mothers who had lower self-efficacy had a more negative experience with their infants when their infants were perceived as more difficult to soothe. Barnes et al., (2007) found that mothers who viewed their children in a negative light were more likely to view themselves in a negative way, and this was associated with maternal depression, infant health status, and infant temperament. Puente et al., (2021) found that mothers that described their infants as being irritable or unstable demonstrated avoidant coping and that avoidant coping was associated with a lack of self-confidence in caring for their infant. The associations between infant social and emotional development and maternal role satisfaction were strongest at the 6- and 12-month time intervals, but associations were strongly positive by 18 months postpartum and 18 months of infant age. This may indicate that by 18 months of age parents had learned coping mechanisms or received the resources needed to support infants with social and emotional developmental issues. This finding warrants further study to determine any correlating factors that this pilot study was unable to account for.

## **Implications for Practice**

The Healthy Families Program in Arizona is a free and voluntary program aimed at helping childbearing and childrearing families enhance their parenting skills, promote early childhood development, and decrease the incidence of child abuse and neglect (Healthy Families, n.d.). In 2022 Healthy Families Arizona served all 15 counties with a total of 3,540 families through 11 different program service sites and 44 Family Support Specialists home visiting teams. This study provides preliminary analysis of some of the data gathered by the Healthy Families Support Specialists in the Verde Valley branch. Further studies based on the data gathered by the Healthy Families Family Support Specialists can help with program expansion and the continued support, resource referral, and the ability to reach more families. As most referrals come from healthcare providers or healthcare facilities, this research supports the value of continued work by the Healthy Families program.

## **Implications for Future Research**

The findings in this study indicate that there is a relationship between infant social and emotional development and maternal role satisfaction. The negative correlation, where higher social and emotional scores (i.e., scores suggesting a developmental concern) were related to lower maternal role satisfaction warrant further investigation. The participants in this study had multiple social disparities that impacted their ability to receive timely care and limited their access to services. In spite of these facts, the mothers in this study seemed to demonstrate resilience to their situation and generally related their satisfaction in their maternal role in a positive light even when they scored higher on the

EPDS. Future research that investigates the links between rural mothers' postpartum depression and resilience would provide perspective on the potential mediating factors on postpartum depression, infant social and emotional development, and maternal role satisfaction. Further, there were many variables included in the Healthy Families Parenting Inventory that may be contributors, but due to small sample size, these could not be fully investigated. Future research to investigate the role of the visiting Healthy Families service provider, resources made available to these mothers, and the impact on their maternal role satisfaction would be an additional area of future study.

### **Limitations**

This study had several limitations. The single greatest limitation was the small sample size, which was greatly exacerbated by the coronavirus pandemic that began in 2020. Participants were less likely to allow outsiders into their home and a majority of time between 2020 and 2023 was spent limiting social contact, quarantining, and visitor restrictions. This led to attrition throughout the data collection and delays in visiting which altered collection timelines and thereby altered assessments at the designated 1-, 6-, 12-, and 18-month timeframes. Additional limitations include the subjective nature of maternal reporting and potential subjectivity in the reporting of data for all measures. There is the potential of bias in the home visitor's assessment of maternal-infant interactions due to the nature of home visiting and preconceptions of ethnicity and social status. An additional limitation for this study is the relative homogeneity of participants as all were required to meet inclusion criteria for the Healthy Families Program.



## **Conclusion**

This study contributes to the limited research on postpartum depression, infant social and emotional development, and maternal role satisfaction in low income, rural mothers in Arizona. As the Healthy Families Program is a statewide initiative and there are multiple home visiting agencies throughout the state, this research provides some of the first analysis of the data gathered by the Healthy Families Program specific to the research variables. Findings in this study do show relationships between postpartum depression and infant social and emotional development in rural mothers who are at high risk for negative parenting and early childhood outcomes. This study provides a basis for additional research in this area and the continued support of programs such as Healthy Families in providing resources to high-risk and vulnerable childbearing and childrearing families.

## REFERENCES

- About | *Healthy families*. (n.d.). <https://www.healthyfamiliesaz.org/about>
- Abrams, L. S., & Curran, L. (2011). Maternal Identity Negotiations Among Low-Income Women With Symptoms of Postpartum Depression. *Qualitative Health Research*, 21(3), 373–385. <https://doi-org.ezproxy1.lib.asu.edu/10.1177/1049732310385123>
- ADHS, 2024 reference: <https://directorsblog.health.azdhs.gov/adhs-initiatives-are-working-to-improve-healthcare-access-in-arizonas-most-rural-communities/>
- Aktas, Songul & Alemdar, Dilek. (2018). An analysis of the relationship between insomnia-fatigue levels of the mothers and their depression and maternal attachment status. *Medicine Science*. 7 (1). 10.5455/medscience.2018.07.8789.
- American Psychological Association. (n.d.). *Postpartum depression: Causes, symptoms, risk factors, and treatment options*. American Psychological Association. <https://www.apa.org/topics/women-girls/postpartum-depression>
- AZDHS: *Womens and Childrens Health – Pregnancy Risk Assessment Monitoring System*. Arizona Department of Health Services. (n.d.). <https://www.azdhs.gov/prevention/womens-childrens-health/prams/index.php>
- Arizona Department of Health Services (2022). Arizona Medically Underserved Areas Biennial Report. In *BUREAU OF WOMEN’S AND CHILDREN’S HEALTH* (p. 02) [Report]. <https://www.azdhs.gov/documents/prevention/health-systems-development/data-reports-maps/reports/azmua-biennial-report.pdf>
- Barnes, J., Ram, B., Leach, P., Altmann, L., Sylva, K., Malmberg, L.-E., Stein, A., & Team, the F. (2007). Factors associated with negative emotional expression: a study of mothers of young infants. *Journal of Reproductive and Infant Psychology*, 25(2), 122–138. <https://doi.org/10.1080/02646830701292399>
- Bauman BL, Ko JY, Cox S, et al. *Vital Signs: Postpartum Depressive Symptoms and Provider Discussions About Perinatal Depression — United States, 2018*. *MMWR Morb Mortal Wkly Rep* 2020;69:575–581. DOI: <http://dx.doi.org/10.15585/mmwr.mm6919a2>
- Beck, C. T., Records, K., & Rice, M. (2006). Further development of the Postpartum Depression Predictors Inventory-Revised. *Journal of obstetric, gynecologic, and neonatal nursing : JOGNN*, 35(6), 735–745. <https://doi.org/10.1111/j.1552-6909.2006.00094.x>

- Bronfenbrenner, U. (1994). Ecological models of human development. In *International Encyclopedia of Education, Vol. 3, 2<sup>nd</sup> Ed.* Oxford: Elsevier. Reprinted in: Gauvain, M. & Cole, M. (Eds.), *Readings on the development of children, 2<sup>nd</sup> Ed.* (1993, pp. 37-43). NY: Freeman.
- Bruce, F Carol MPH, BSN1; Berg, Cynthia J. MD, MPH1; Hornbrook, Mark C. PhD2,4; Whitlock, Evelyn P. MD, MPH2,3; Callaghan, William M. MD, MPH1; Bachman, Donald J. MS2; Gold, Rachel PhD, MPH2,3; Dietz, Patricia M. DrPH, MPH1. Maternal Morbidity Rates in a Managed Care Population. *Obstetrics & Gynecology* 111(5):p 1089-1095, May 2008. | DOI: 10.1097/AOG.0b013e31816c441a
- Bureau, U. S. C. (n.d.). *S1703: Selected Characteristics of People at Specified Levels of Poverty in the Past 12 Months*. Explore census data. <https://data.census.gov/table/ACSST5Y2022.S1703?g=050XX00US04025>
- Centers for Disease Control and Prevention. (2021, November 24). *Breastfeeding report card*. Centers for Disease Control and Prevention. Retrieved August 10, 2022, from <https://www.cdc.gov/breastfeeding/data/reportcard.htm>
- Centers for Disease Control and Prevention. (2022, August 1). *Results: Breastfeeding rates*. Centers for Disease Control and Prevention. Retrieved August 10, 2022, from [https://www.cdc.gov/breastfeeding/data/nis\\_data/results.html](https://www.cdc.gov/breastfeeding/data/nis_data/results.html)
- Centers for Disease Control and Prevention. (2023, November 28). *Selected 2016 through 2020 maternal and child health (MCH) indicators*. Centers for Disease Control and Prevention. <https://www.cdc.gov/prams/prams-data/selected-mch-indicators.html>
- Challacombe, F. L., Salkovskis, P. M., Woolgar, M., Wilkinson, E. L., Read, J., & Acheson, R. (2016). Parenting and mother-infant interactions in the context of maternal postpartum obsessive-compulsive disorder: Effects of obsessional symptoms and mood. *Infant Behavior & Development, 44*, 11–20. APA PsycInfo®. <https://doi.org/10.1016/j.infbeh.2016.04.003>
- Cole, R., Young, J., Kearney, L., & Thompson, J. M. D. (2020). Reducing sleep-related infant mortality through understanding factors associated with breastfeeding duration: A cross-sectional survey. *Breastfeeding Review, 28*(1), 7–19.
- Corwin, E. J. & Arbour, M. (2007). Postpartum Fatigue and Evidence-Based Interventions. *MCN, The American Journal of Maternal/Child Nursing, 32* (4), 215-220. Doi: 10.1097/01.NMC.0000281959.71454.e5.

- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of Postnatal Depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, 150(6), 782–786. Doi:10.1192/bjp.150.6.782
- Dagher, R. K., McGovern, P. M., Dowd, B. E., & Lundberg, U. (2011). Postpartum depressive symptoms and the combined load of paid and unpaid work: A longitudinal analysis. *International Archives of Occupational and Environmental Health*, 84(7), 735–743. <https://doi.org/10.1007/s00420-011-0626-7>
- Denis, A., Ponsin, M., & Callahan, S. (2012). The relationship between maternal self-esteem, maternal competence, infant temperament and post-partum blues. *Journal of Reproductive and Infant Psychology*, 30(4), 388–397. APA PsycInfo®. <https://doi.org/10.1080/02646838.2012.718751>
- Diagnostic and statistical manual of mental disorders : DSM-5* (Fifth edition.). (2013). American Psychiatric Association. PMID: PMC10256483.
- Do D, Lee T, Patel U. EPH174 Trends in Postpartum Depression before and during the COVID-19 Pandemic and Correlates of Treatment Choices: A Population-Based Retrospective Cohort Study. *Value Health*. 2023 Jun;26(6):S195–6. Doi: 10.1016/j.jval.2023.03.1056. Epub 2023 Jun 10.
- Edhborg, M., Matthiesen, A.-S., Lundh, W., & Widström, A.-M. (2005). Some early indicators for depressive symptoms and bonding 2 months postpartum—A study of new mothers and fathers. *Archives of Women's Mental Health*, 8(4), 221–231. APA PsycInfo®. <https://doi.org/10.1007/s00737-005-0097-5>
- Federal Poverty Level (FPL) – glossary*. Federal Poverty Level (FPL) – Glossary | HealthCare.gov. (n.d.). <https://www.healthcare.gov/glossary/federal-poverty-level-fpl/>
- Field, T. (2018). Postnatal anxiety prevalence, predictors and effects on development: A narrative review. *Infant Behavior & Development*, 51, 24–32. CINAHL Plus with Full Text. <https://doi.org/10.1016/j.infbeh.2018.02.005>
- Frese, B. & Nguyen, M. (2022). The Evolution of Maternal Role Attainment. *Advances in Nursing Science*, 45 (4), 323-334. Doi: 10.1097/ANS.0000000000000422.
- Fowles, E. R. (1998). The Relationship Between Maternal Role Attainment and Postpartum Depression. *Health Care for Women International*, 19(1), 83–94. <https://doi.org/10.1080/073993398246601>
- Galler, J. R., Harrison, R. H., Ramsey, F., Butler, S., & Forde, V. (2004). Postpartum maternal mood, feeding practices, and infant temperament in Barbados. *Infant*

- Behavior & Development*, 27(3), 267–287. APA PsycInfo®.  
<https://doi.org/10.1016/j.infbeh.2003.11.002>
- Getahun, D., Oyelese, Y., Peltier, M., Yeh, M., Chiu, V. Y., Takhar, H., Khadka, N., Mensah, N., Avila, C., & Fassett, M. J. (2023). Trends in Postpartum Depression by Race/Ethnicity and Pre-pregnancy Body Mass Index. *American Journal of Obstetrics and Gynecology*, 228(1), S122–S123. <https://doi.org/10.1016/j.ajog.2022.11.248>
- Gibson, J., McKenzie-McHarg, K., Shakespeare, J., Price, J., & Gray, R. (2009). A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica*, 119(5), 350–364. <https://doi.org/10.1111/j.1600-0447.2009.01363.x>
- Glynn, L. M., Davis, E. P., Schetter, C. D., Chiciz-DeMet, A., Hobel, C. J., & Sandman, C. A. (2007). Postnatal maternal cortisol levels predict temperament in healthy breastfed infants. *Early Human Development*, 83(10), 675–681. APA PsycInfo®. <https://doi.org/10.1016/j.earlhumdev.2007.01.003>
- Goodman, S. H., Bakeman, R., McCallum, M., Rouse, M. H., & Thompson, S. F. (2017). Extending Models of Sensitive Parenting of Infants to Women at Risk for Perinatal Depression. *Parenting: Science & Practice*, 17(1), 30–50. CINAHL Plus with Full Text. <https://doi.org/10.1080/15295192.2017.1262181>
- Grey, K. R., Davis, E. P., Sandman, C. A., & Glynn, L. M. (2013). Human milk cortisol is associated with infant temperament. *Psychoneuroendocrinology*, 38(7), 1178–1185. APA PsycInfo®. <https://doi.org/10.1016/j.psyneuen.2012.11.002>
- Hardin, J. S., Jones, N. A., Mize, K. D., & Platt, M. (2021). Affectionate Touch in the Context of Breastfeeding and Maternal Depression Influences Infant Neurodevelopmental and Temperamental Substrates. *Neuropsychobiology*, 80(2), 158–175. <https://doi.org/10.1159/000511604>
- Hartman, S., Sayler, K., & Belsky, J. (2019). Prenatal stress enhances postnatal plasticity: The role of microbiota. *Developmental Psychobiology*, 61(5), 729–738. <https://doi.org/10.1002/dev.21816>
- Hinde, K., Skibieli, A. L., Foster, A. B., Del Rosso, L., Mendoza, S. P., & Capitanio, J. P. (2015). Cortisol in mother's milk across lactation reflects maternal life history and predicts infant temperament. *Behavioral Ecology*, 26(1), 269–281. <https://doi.org/10.1093/beheco/aru186>
- James, D., Dobson, B., & American Dietetic Association. (2009). Position of the American Dietetic Association: Promoting and Supporting Breastfeeding *Journal*

- of the Academy of Nutrition and Dietetics, 109(11), 1926 – 1942.  
DOI: <https://doi.org/10.1016/j.jada.2009.09.018>
- Kernot, J., Olds, T., Lewis, L. K., & Maher, C. (2015). Test-retest reliability of the English version of the Edinburgh Postnatal Depression Scale. *Archives of Women's Mental Health, 18*(2), 255–257. <https://doi.org/10.1007/s00737-014-0461-4>
- Kielbratowska, B., Kazmierczak, M., Michalek, J., & Preis, K. (2015). Temperament and the mother–infant dyad: Associations with breastfeeding and formula feeding with a bottle. *Infant Mental Health Journal, 36*(3), 243–250. APA PsycInfo®. <https://doi.org/10.1002/imhj.21508>
- Kim, Y., Bird, A., Peterson, E., Underwood, L., Morton, S. M. B., & Grant, C. C. (2020). Maternal antenatal depression and early childhood sleep: Potential pathways through infant temperament. *Journal of Pediatric Psychology, 45*(2), 203–217. APA PsycInfo®. <https://doi.org/10.1093/jpepsy/jsaa001>
- Kordi, M., Fasanghari, M., Asgharipour, N., & Esmaily, H. (2017). The effect of maternal role training program on role attainment and maternal role satisfaction in nulliparous women with unplanned pregnancy. *Journal of education and health promotion, 6*, 61. [https://doi.org/10.4103/jehp.jehp\\_113\\_15](https://doi.org/10.4103/jehp.jehp_113_15)
- Labbok, M., & Krasovec, K. (1990). Toward Consistency in Breastfeeding Definitions. *Studies in Family Planning, 21*(4), 226–230. <https://doi.org/10.2307/1966617>
- Leahy Warren, P. (2005), First-time mothers: social support and confidence in infant care. *Journal of Advanced Nursing, 50*: 479-488. <https://doi.org/10.1111/j.1365-2648.2005.03425.x>
- Leahy-Warren, P., McCarthy, G.& Corcoran, P. (2012), First-time mothers: social support, maternal parental self-efficacy and postnatal depression. *Journal of Clinical Nursing, 21*: 388-397. <https://doi.org/10.1111/j.1365-2702.2011.03701.x>
- LeCroy & Milligan, Associates, INC. (2023, April). *Healthy Families 52nd annual evaluation report*. Healthy Families Arizona Annual Evaluation Report October 2021 – September 2022 . [https://dcs.az.gov/sites/default/files/DCS-Reports/HFAz\\_Annual\\_Evaluation\\_Report\\_FY2022.pdf](https://dcs.az.gov/sites/default/files/DCS-Reports/HFAz_Annual_Evaluation_Report_FY2022.pdf)
- Leerkes, E. M., & Crockenberg, S. C. (2002). The Development of Maternal Self-Efficacy and Its Impact on Maternal Behavior. *Infancy, 3*(2), 227–247. [https://doi.org/10.1207/S15327078IN0302\\_7](https://doi.org/10.1207/S15327078IN0302_7)

- Li, H. Maternal-Infant Attachment and its Relationships with Postpartum Depression, Anxiety, Affective Instability, Stress, and Social Support in a Canadian Community Sample. *Psychiatr Q* **94**, 9–22 (2023).  
<https://doi.org/10.1007/s11126-022-10011-w>
- Logsdon, M. C., Wisner, K. L., & Pinto-Foltz, M. D. (2006). The impact of postpartum depression on mothering. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *35*(5), 652-658.
- Malik F, Marwaha R. Developmental Stages of Social Emotional Development in Children. [Updated 2022 Sep 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from:  
<https://www.ncbi.nlm.nih.gov/books/NBK534819/>
- Mason, Z. S., Briggs, R. D., & Silver, E. J. (2011). Maternal attachment feelings mediate between maternal reports of depression, infant social–emotional development, and parenting stress. *Journal of Reproductive & Infant Psychology*, *29*(4), 382–394.  
<https://doi-org.ezproxy1.lib.asu.edu/10.1080/02646838.2011.629994>
- Mathews, M. E., Leerkes, E. M., Lovelady, C. A., & Labban, J. D. (2014). Psychosocial predictors of primiparous breastfeeding initiation and duration. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association*, *30*(4), 480–487. <https://doi.org/10.1177/0890334414537707>
- McMeekin, S., Jansen, E., Mallan, K., Nicholson, J., Magarey, A., & Daniels, L. (2013). Associations between infant temperament and early feeding practices. A cross-sectional study of Australian mother-infant dyads from the NOURISH 53 randomized controlled trial. *Appetite*, *60*, 239–245. APA PsycInfo®.  
<https://doi.org/10.1016/j.appet.2012.10.005>
- Meighan, M. (2017, February 9). *Maternal role attainment-becoming a mother*. Nurse Key. <https://nursekey.com/maternal-role-attainment-becoming-a-mother/>
- Melchior, M., Chastang, J.-F., de Lauzon, B., Galéra, C., Saurel-Cubizolles, M.-J., & Larroque, B. (2012). Maternal depression, socioeconomic position, and temperament in early childhood: The EDEN mother–child cohort. *Journal of Affective Disorders*, *137*(1–3), 165–169. APA PsycInfo®.  
<https://doi.org/10.1016/j.jad.2011.09.018>
- Meltzer-Brody, & Jones, I. (2015). Optimizing the treatment of mood disorders in the perinatal period. *Dialogues in Clinical Neuroscience*, *17*(2), 207–218.  
<https://doi.org/10.31887/DCNS.2015.17.2/smeltzerbrody>

- Mercer, R.T. (2004), Becoming a Mother Versus Maternal Role Attainment. *Journal of Nursing Scholarship*, 36: 226-232. <https://doi-org.ezproxy1.lib.asu.edu/10.1111/j.1547-5069.2004.04042.x>
- Mercer, R. T. [1991]. *Maternal role: Models and consequences*. Paper presented at the International Research Conference sponsored by the Council of Nurse Researchers and the American Nurses Association, Los Angeles, CA. Copyright Ramona T. Mercer, 1991.
- Mercer R. T. (1985). The process of maternal role attainment over the first year. *Nursing research*, 34(4), 198–204.
- Micali, N., Simonoff, E., Stahl, D., & Treasure, J. (2011). Maternal eating disorders and infant feeding difficulties: Maternal and child mediators in a longitudinal general population study. *Journal of Child Psychology and Psychiatry*, 52(7), 800–807. APA PsycInfo®. <https://doi.org/10.1111/j.1469-7610.2010.02341.x>
- Mollard E, Hudson DB, Ford A, Pullen C. An Integrative Review of Postpartum Depression in Rural U.S. Communities. *Arch Psychiatr Nurs*. 2016 Jun;30(3):418-24. Doi: 10.1016/j.apnu.2015.12.003. Epub 2015 Dec 17. PMID: 27256951.
- Mughal S, Azhar Y, Siddiqui W. Postpartum Depression. [Updated 2022 Oct 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK519070/>
- Nieto, L., Lara, M. A., Navarrete, L., & Manzo, G. (2019). Infant temperament and perinatal depressive and anxiety symptoms in Mexican women. *Sexual & Reproductive Healthcare*, 21, 39–45. <https://doi.org/10.1016/j.srhc.2019.05.005>
- Ngai, F. , Wai-Chi Chan, S. & Ip, W. (2010). Predictors and Correlates of Maternal Role Competence and Satisfaction. *Nursing Research*, 59 (3), 185-193. Doi: 10.1097/NNR.0b013e3181dbb9ee.
- Ohan, J. L., Leung, D. W., & Johnston, C. (2000). The Parenting Sense of Competence scale: Evidence of a stable factor structure and validity. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, 32(4), 251-261. <https://doi.org/10.1037/h0087122>
- Orhon, F. S., Ulukol, B., & Soykan, A. (2007). Postpartum mood disorders and maternal perceptions of infant patterns in well-child follow-up visits. *Acta Paediatrica*, 96(12), 1777–1783. APA PsycInfo®. <https://doi.org/10.1111/j.1651-2227.2007.00557.x>



- Oyetunji, A., & Chandra, P. (2020). Postpartum stress and infant outcome: A review of current literature. *Psychiatry Research*, 284, 9. APA PsycInfo®. <https://doi.org/10.1016/j.psychres.2020.112769>
- Ozdemir, J., & Ozcan, S. (2023). Do postpartum insomnia, fatigue and depression affect the maternal role of primiparous women? *Women & Health*, 63(10), 837–846. <https://doi-org.ezproxy1.lib.asu.edu/10.1080/03630242.2023.2276150>
- Parizkova, P., Dankova, N., Frühauf, P., Jireckova, J., Zeman, J., & Magner, M. (2020). Associations between breastfeeding rates and infant disease: A survey of 2338 Czech children. *Nutrition & Dietetics*, 77(3), 310–314. <https://doi-org.ezproxy1.lib.asu.edu/10.1111/1747-0080.12532>
- Park, S.-H., & Kim, J.-I. (2023). Predictive validity of the Edinburgh postnatal depression scale and other tools for screening depression in pregnant and postpartum women: a systematic review and meta-analysis. *Archives of Gynecology and Obstetrics*, 307(5), 1331–1345. <https://doi.org/10.1007/s00404-022-06525-0>
- Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*;372:n71. Doi: 10.1136/bmj.n71
- Peñacoba Puente, C., Suso-Ribera, C., Blanco Rico, S., Marín, D., San Román Montero, J., & Catalá, P. (2021). Is the Association between Postpartum Depression and Early Maternal-Infant Relationships Contextually Determined by Avoidant Coping in the Mother? *International Journal of Environmental Research and Public Health*, 18(2). <https://doi.org/10.3390/ijerph18020562>
- Porter, E., Porter, A. J., Lewis, S. J., & Watson, M. (2019). Perinatal maternal mental health and infant socio-emotional development: A growth curve analysis using the MPEWS cohort. *Infant Behavior & Development*, 57. <https://doi.org/10.1016/j.infbeh.2019.101336>
- Power, C., Williams, C., & Brown, A. (2022). Physical and Psychological Childbirth Experiences and Early Infant Temperament. *Frontiers in Psychology*, 13, 792392. <https://doi.org/10.3389/fpsyg.2022.792392>
- Padrutt, E. R., DeJoseph, M. L., Wilson, S., Mills-Koonce, R., & Berry, D. (2023). Measurement invariance of maternal depressive symptoms across the first 2 years since birth and across racial group, education, income, primiparity, and age. *Psychological Assessment*, 35(8), 646-658. <https://doi-org.ezproxy1.lib.asu.edu/10.1037/pas0001242>

- Postpartum depression: Causes, symptoms, risk factors, and treatment options.* (n.d.). <https://www.apa.org>. <https://www.apa.org/topics/women-girls/postpartum-depression>
- Ramakrishna, S., Cooklin, A. R., & Leach, L. S. (2019). Comorbid anxiety and depression: A community-based study examining symptomology and correlates during the postpartum period. *Journal of Reproductive & Infant Psychology*, 37(5), 468–479. CINAHL Plus with Full Text. <https://doi.org/10.1080/02646838.2019.1578870>
- Rode, J., & Kiel, E. (2016). The mediated effects of maternal depression and infant temperament on maternal role. *Archives of Women's Mental Health*, 19(1), 133–140. <https://doi-org.ezproxy1.lib.asu.edu/10.1007/s00737-015-0540-1>
- Rogers, & Blissett, J. (2017). Breastfeeding duration and its relation to weight gain, eating behaviours and positive maternal feeding practices in infancy. *Appetite*, 108, 399–406. <https://doi.org/10.1016/j.appet.2016.10.020>
- Rogers, S. L., & Blissett, J. (2019). Infant temperament, maternal feeding behaviours and the timing of solid food introduction. *Maternal & Child Nutrition*, 15(3), N.PAG-N.PAG. CINAHL Plus with Full Text. <https://doi.org/10.1111/mcn.12771>
- Rubin, R. (1967). Attainment of the Maternal Role. *Nursing Research*, 16 (3), 237-245.
- Rubin, Reva. (1984). *Maternal identity and the maternal experience*. Springer Pub. Co.
- Salomonsson, B.& Sleded, M. (2010), The Ages & Stages Questionnaire: Social–Emotional: A validation study of a mother-report questionnaire on a clinical mother–infant sample<sup>†</sup>. *Infant Ment. Health J.*, 31: 412-431. <https://doi.org/10.1002/imhj.20263>
- Seth, S., Lewis, A.J. & Galbally, M. Perinatal maternal depression and cortisol function in pregnancy and the postpartum period: a systematic literature review. *BMC Pregnancy Childbirth* 16, 124 (2016). <https://doi.org/10.1186/s12884-016-0915-y>
- Shiner, R.L., Buss, K.A., McClowry, S.G., Putnam, S.P., Saudino, K.J. and Zentner, M. (2012), What Is Temperament Now? Assessing Progress in Temperament Research on the Twenty-Fifth Anniversary of Goldsmith et al. (). *Child Dev Perspect*, 6: 436-444. <https://doi-org.ezproxy1.lib.asu.edu/10.1111/j.1750-8606.2012.00254.x>
- Smith-Nielsen, J., Tharner, A., Steele, H., Cordes, K., Mehlhase, H., & Vaever, M. S. (2016). Postpartum depression and infant-mother attachment security at one year:

- The impact of co-morbid maternal personality disorders. *Infant Behavior & Development*, 44, 148–158. <https://doi.org/10.1016/j.infbeh.2016.06.002>
- Sörensen F, Kimmel MC, Brenner V, Krägeloh-Mann I, Skalkidou A, Mahjani B, Fransson E. Interactions of perinatal depression versus anxiety and infants' early temperament trajectories. *Child Dev.* 2023 Nov 27. Doi: 10.1111/cdev.14041. Epub ahead of print. PMID: 38010823.
- Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional Edition 2*. [https://www.nhais.org/Intranet/hs/Child\\_Program\\_File\\_PY55/Section\\_6\\_Mental\\_Health/HS\\_MH/6.1\\_ASQ-SE\\_2\\_Master\\_Set-English.pdf](https://www.nhais.org/Intranet/hs/Child_Program_File_PY55/Section_6_Mental_Health/HS_MH/6.1_ASQ-SE_2_Master_Set-English.pdf)
- Suri, R. & Altshuler, L. Postpartum Depression: Advances in Recognition and Treatment. *FOCUS*, 10(1), 15–21, <https://doi.org/10.1176/appi.focus.10.1.15>.
- Thompson, A. L., Wasser, H., Nulty, A., & Bentley, M. E. (2021). Feeding style profiles are associated with maternal and infant characteristics and infant feeding practices and weight outcomes in African American mothers and infants. *Appetite*, 160, 10. APA PsycInfo®. <https://doi.org/10.1016/j.appet.2020.105084>
- Thornton, R., & Nardi, P. M. (1975). The Dynamics of Role Acquisition. *American Journal of Sociology*, 80(4), 870–885. <http://www.jstor.org/stable/2777199>
- U.S. Census Bureau. (n.d.). *Explore Census data*. <https://data.census.gov/table/ACSDP1Y2022.DP02?g=050XX00US04025&tid=ACSDP1Y2022.DP02>
- U.S. Department of Health and Human Services. (n.d.). *Perinatal depression*. National Institute of Mental Health. <https://www.nimh.nih.gov/health/publications/perinatal-depression>
- Weng, S. F., Redsell, S. A., Swift, J. A., Yang, M., & Glazebrook, C. P. (2012). Systematic review and meta-analyses of risk factors for childhood overweight identifiable during infancy. *Archives of Disease in Childhood*, 97(12), 1019–1026. <https://doi.org/10.1136/archdischild-2012-302263>
- World Health Organization. (2022). *Breastfeeding*. World Health Organization. Retrieved August 10, 2022, from [https://www.who.int/nutrition/topics/exclusive\\_breastfeeding/en/](https://www.who.int/nutrition/topics/exclusive_breastfeeding/en/)
- Wouk, K., Gottfredson, N. C., Tucker, C., Pence, B. W., Meltzer-Brody, S., Zvara, B., Grewen, K., & Stuebe, A. M. (2019). Positive emotions during infant feeding and

postpartum mental health. *Journal of Women's Health*, 28(2), 194–202. APA PsycInfo®. <https://doi.org/10.1089/jwh.2017.6889>

*Yavapai County, Arizona*. AZ Census. (n.d.). <https://www.azcensus.com/yavapai-county/>

APPENDIX A

EDINBURGH PERINATAL/POSTNATAL DEPRESSION SCALE (EPDS)

## Edinburgh Perinatal/Postnatal Depression Scale (EPDS)

### SCORING GUIDE

- |   |   |
|---|---|
| <p>1. I have been able to laugh and see the funny side of things</p> <p>0 As much as I always could<br/>1 Not quite so much now<br/>2 Definitely not so much now<br/>3 Not at all</p> <p>2. I have looked forward with enjoyment to things</p> <p>0 As much as I ever did<br/>1 Rather less than I used to<br/>2 Definitely less than I used to<br/>3 Hardly at all</p> <p>3. I have blamed myself unnecessarily when things went wrong</p> <p>3 Yes, most of the time<br/>2 Yes, some of the time<br/>1 Not very often<br/>0 No, never</p> <p>4. I have been anxious or worried for no good reason</p> <p>0 No, not at all<br/>1 Hardly ever<br/>2 Yes, sometimes<br/>3 Yes, very often</p> <p>5. I have felt scared or panicky for no very good reason</p> <p>3 Yes, quite a lot<br/>2 Yes, sometimes<br/>1 No, not much<br/>0 No, not at all</p> | <p>6. Things have been getting on top of me</p> <p>3 Yes, most of the time I haven't been able to cope<br/>2 Yes, sometimes I haven't been coping as well as usual<br/>1 No, most of the time I have coped quite well<br/>0 No, I have been coping as well as ever</p> <p>7. I have been so unhappy that I have had difficulty sleeping</p> <p>3 Yes, most of the time<br/>2 Yes, sometimes<br/>1 Not very often<br/>0 No, not at all</p> <p>8. I have felt sad or miserable</p> <p>3 Yes, most of the time<br/>2 Yes, quite often<br/>1 Not very often<br/>0 No, not at all</p> <p>9. I have been so unhappy that I have been crying</p> <p>3 Yes, most of the time<br/>2 Yes, quite often<br/>1 Only occasionally<br/>0 No, never</p> <p>10. The thought of harming myself has occurred to me</p> <p>3 Yes, quite often<br/>2 Sometimes<br/>1 Hardly ever<br/>0 Never</p> |
|---|---|

| EPDS Score   | Interpretation                        | Action  |
|--|---------------------------------------|---|
| Less than 8  | Depression not likely                 | Continue support  |
| 9–11   | Depression possible                   | Support, re-screen in 2–4 weeks. Consider referral to primary care provider (PCP).  |
| 12–13  | Fairly high possibility of depression | Monitor, support and offer education. Refer to PCP.   |
| 14 and higher (positive screen)                              | Probable depression                   | Diagnostic assessment and treatment by PCP and/or specialist.   |
| Positive score (1, 2 or 3) on question 10 (suicidality risk) |                                       | Immediate discussion required. Refer to PCP ± mental health specialist or emergency resource for further assessment and intervention as appropriate. Urgency of referral will depend on several factors including: whether the suicidal ideation is accompanied by a plan, whether there has been a history of suicide attempts, whether symptoms of a psychotic disorder are present and/or there is concern about harm to the baby. |

**References:**

Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *The British Journal of Psychiatry*. 1987; 150(6):782-786.  
 BC Reproductive Mental Health Program and Perinatal Services BC. (2014), *Best Practice Guidelines for Mental Health Disorders in the Perinatal Period*. Available at: <http://tiny.cc/MHGuidelines>

Revised March 2015

APPENDIX B  
HEALTHY FAMILY PARENTING INVENTORY

Site Number \_\_\_\_\_  
 Interval \_\_\_\_\_ (e.g., baseline, 6-month, 12-month, etc.)

Child ID # \_\_\_\_\_  
 Date \_\_\_\_\_

### Healthy Families Parenting Inventory©

Directions: Please choose ONE answer that best fits for you and color in the circle. ●

|  | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|--|-----------------|----------------------|------------------|-----------------------|----------------------------|
|  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 1. I feel supported by others.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 2. I feel that others care about me.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 3. I discuss my feelings with someone.                                       | ①               | ②                    | ③                | ④                     | ⑤                          |
| 4. If I have trouble, I feel there is always someone I can turn to for help. | ①               | ②                    | ③                | ④                     | ⑤                          |
| 5. I have family or friends who I can turn to for help.                      | ①               | ②                    | ③                | ④                     | ⑤                          |
| 6. I learn new ways of doing things from solving problems.                   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 7. I deal with setbacks without getting discouraged.                         | ①               | ②                    | ③                | ④                     | ⑤                          |
| 8. When I have a problem, I take steps to solve it.                          | ①               | ②                    | ③                | ④                     | ⑤                          |
| 9. When I am faced with a problem, I can think of several solutions.         | ①               | ②                    | ③                | ④                     | ⑤                          |
| 10. I am good at dealing with unexpected problems.                           | ①               | ②                    | ③                | ④                     | ⑤                          |
| 11. I remain calm when new problems come up.                                 | ①               | ②                    | ③                | ④                     | ⑤                          |
| 12. I feel sad.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 13. I feel positive about myself.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 14. The future looks positive for me.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 15. I feel unhappy about everything.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 16. I feel hopeless about the future.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 17. There isn't much happiness in my life.                                   | ①               | ②                    | ③                | ④                     | ⑤                          |
|  | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|  | ①               | ②                    | ③                | ④                     | ⑤                          |



Child ID # \_\_\_\_\_

Directions: Please choose ONE answer that best fits for you and color in the circle. ●

|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|---|-----------------|----------------------|------------------|-----------------------|----------------------------|
|   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 18. I have so many problems I feel overwhelmed by them.         | ①               | ②                    | ③                | ④                     | ⑤                          |
| 19. It is hard for me to get in a good mood.                    | ①               | ②                    | ③                | ④                     | ⑤                          |
| 20. My life is fulfilling and meaningful.                       | ①               | ②                    | ③                | ④                     | ⑤                          |
| 21. I find ways to care for myself.                             | ①               | ②                    | ③                | ④                     | ⑤                          |
| 22. I take care of my appearance.                               | ①               | ②                    | ③                | ④                     | ⑤                          |
| 23. I get enough sleep.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 24. I am a better parent because I take care of myself.         | ①               | ②                    | ③                | ④                     | ⑤                          |
| 25. I take time for myself.                                     | ①               | ②                    | ③                | ④                     | ⑤                          |
| 26. I know where to find resources for my family.               | ①               | ②                    | ③                | ④                     | ⑤                          |
| 27. I know where to find important medical information.         | ①               | ②                    | ③                | ④                     | ⑤                          |
| 28. I can get help from the community if I need it.             | ①               | ②                    | ③                | ④                     | ⑤                          |
| 29. I am comfortable in finding the help I need.                | ①               | ②                    | ③                | ④                     | ⑤                          |
| 30. I know community agencies I can go to for help.             | ①               | ②                    | ③                | ④                     | ⑤                          |
| 31. It is hard for me to ask for help from others.              | ①               | ②                    | ③                | ④                     | ⑤                          |
| 32. Because I'm a parent, I've had to give up much of my life.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 33. I feel trapped by all the things I have to do for my child. | ①               | ②                    | ③                | ④                     | ⑤                          |
| 34. I feel drained dealing with my child.                       | ①               | ②                    | ③                | ④                     | ⑤                          |
|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|   | ①               | ②                    | ③                | ④                     | ⑤                          |

Child ID # \_\_\_\_\_

Directions: Please choose ONE answer that best fits for you and color in the circle. ●

|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|---|-----------------|----------------------|------------------|-----------------------|----------------------------|
|   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 35. There are times my child gets on my nerves.                               | ①               | ②                    | ③                | ④                     | ⑤                          |
| 36. I feel controlled by all the things I have to do as a parent.             | ①               | ②                    | ③                | ④                     | ⑤                          |
| 37. I feel frustrated because my whole life seems to revolve around my child. | ①               | ②                    | ③                | ④                     | ⑤                          |
| 38. I have a hard time managing my child.                                     | ①               | ②                    | ③                | ④                     | ⑤                          |
| 39. I can be patient with my child.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 40. I respond quickly to my child's needs.                                    | ①               | ②                    | ③                | ④                     | ⑤                          |
| 41. I do activities that help my child grow and develop.                      | ①               | ②                    | ③                | ④                     | ⑤                          |
| 42. When my child is upset, I'm not sure what to do.                          | ①               | ②                    | ③                | ④                     | ⑤                          |
| 43. I use positive words to encourage my child.                               | ①               | ②                    | ③                | ④                     | ⑤                          |
| 44. I can tell what my child wants.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 45. I am able to increase my child's good behavior.                           | ①               | ②                    | ③                | ④                     | ⑤                          |
| 46. I can remain calm when my child is upset.                                 | ①               | ②                    | ③                | ④                     | ⑤                          |
| 47. I praise my child every day.  | ①               | ②                    | ③                | ④                     | ⑤                          |
| 48. My child has favorite things to comfort him/her.                          | ①               | ②                    | ③                | ④                     | ⑤                          |
| 49. I read to my child.   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 50. I plan and do a variety of activities with my child every day.            | ①               | ②                    | ③                | ④                     | ⑤                          |
| 51. I have made my home exciting and fun for my child.                        | ①               | ②                    | ③                | ④                     | ⑤                          |
| 52. I have organized my home for raising a child.                             | ①               | ②                    | ③                | ④                     | ⑤                          |
|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|   | ①               | ②                    | ③                | ④                     | ⑤                          |

Child ID # \_\_\_\_\_

Directions: Please choose ONE answer that best fits for you and color in the circle. ●

|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|---|-----------------|----------------------|------------------|-----------------------|----------------------------|
|   | ①               | ②                    | ③                | ④                     | ⑤                          |
| 53. I check my home for safety.                                 | ①               | ②                    | ③                | ④                     | ⑤                          |
| 54. My child has a schedule for eating and sleeping in my home. | ①               | ②                    | ③                | ④                     | ⑤                          |
| 55. I set limits for my child consistently.                     | ①               | ②                    | ③                | ④                     | ⑤                          |
| 56. I make plans for our family to do things together.          | ①               | ②                    | ③                | ④                     | ⑤                          |
| 57. I set rules for behavior in my home.                        | ①               | ②                    | ③                | ④                     | ⑤                          |
| 58. I feel I'm doing an excellent job as a parent.              | ①               | ②                    | ③                | ④                     | ⑤                          |
| 59. I am proud of myself as a parent.                           | ①               | ②                    | ③                | ④                     | ⑤                          |
| 60. I am more effective than most parents.                      | ①               | ②                    | ③                | ④                     | ⑤                          |
| 61. I have set goals about how I want to raise my child.        | ①               | ②                    | ③                | ④                     | ⑤                          |
| 62. I am a good example to other parents.                       | ①               | ②                    | ③                | ④                     | ⑤                          |
| 63. I learn new parenting skills and use them with my child.    | ①               | ②                    | ③                | ④                     | ⑤                          |
|   | Rarely or never | A little of the time | Some of the time | Good part of the time | Always or most of the time |
|   | ①               | ②                    | ③                | ④                     | ⑤                          |

**Thank you for completing this survey!**



APPENDIX C

AGES & STAGES QUESTIONNAIRE: SOCIAL-EMOTIONAL EDITION 2

## 6 Month Questionnaire 3 months 0 days through 8 months 30 days



Questions about behaviors babies may have are listed on the following pages. Please read each question carefully and check the box  that best describes your baby's behavior. Also, check the circle  if the behavior is a concern.

### Important Points to Remember:

- Answer questions based on what you know about your baby's behavior.
- Answer questions based on your baby's usual behavior, not behavior when your baby is sick, very tired, or hungry.
- Caregivers who know the baby well and spend more than 15–20 hours per week with the baby should complete ASQ:SE-2.
- Please return this questionnaire by: \_\_\_\_\_
- If you have any questions or concerns about your baby or about this questionnaire, contact: \_\_\_\_\_
- Thank you and please look forward to filling out another ASQ:SE-2 in \_\_\_\_\_ months.


|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |       |
|---|----------------------------|----------------------------|----------------------------|----------------------------|-------|
| 1. When upset, can your baby calm down within a half hour?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 2. Does your baby smile at you and other family members?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 3. Does your baby like to be picked up and held?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 4. Does your baby stiffen and arch her back when picked up?   | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | _____ |
| 5. When you talk to your baby, does he look at you and seem to listen?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 6. Does your baby let you know when she is hungry or sick?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 7. Does your baby seem to enjoy watching or listening to people? For example, does he turn his head to look at someone talking? | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 6 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|----------------------------|----------------------------|----------------------------|----------------------------|---|
| 8. Is your baby able to calm herself down (for example, by sucking her hand or pacifier)?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 9. Does your baby cry for long periods of time?   | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 10. Is your baby's body relaxed?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 11. Does your baby have trouble sucking from a breast or bottle?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 12. Does it take longer than 30 minutes to feed your baby?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 13. Do you and your baby enjoy feeding times together?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 14. Does your baby have any eating problems, such as gagging, vomiting, or _____? (Please describe.)<br>_____<br>_____  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 15. During the day, does your baby stay awake for an hour or longer at one time?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 16. Does your baby have trouble falling asleep at naptime or at night?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

P201060200


Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
© 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.

page 2 of 4

# 6 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|----------------------------|----------------------------|----------------------------|----------------------------|---|
| 17. Does your baby sleep at least 10 hours in a 24-hour period?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 18. Does your baby get constipated or have diarrhea?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 19. Does your baby make sounds and look at you while playing with you?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 20. Does your baby make sounds or use gestures to get your attention?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 21. When you smile at your baby, does he smile back at you?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 22. When you talk or make sounds to your baby, does she make sounds back?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 23. Has anyone shared concerns about your baby's behaviors? If "sometimes" or "often or always," please explain:<br>_____<br>_____<br>_____       | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

P201060300

Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
© 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.

page 3 of 4



## 6 Month Questionnaire



**OVERALL.** Use the space below for additional comments.

24. Do you have concerns about your baby's eating or sleeping behaviors? If yes, please explain:  YES  NO

---

---

---

25. Does anything about your baby worry you? If yes, please explain:  YES  NO

---

---

---

26. What do you enjoy about your baby?

---

---

---

# 6 Month Information Summary 3 months 0 days through 8 months 30 days



Baby's name: \_\_\_\_\_ Date ASQ:SE-2 completed: \_\_\_\_\_  
 Baby's ID #: \_\_\_\_\_ Baby's date of birth: \_\_\_\_\_  
 Person who completed ASQ:SE-2: \_\_\_\_\_ Baby's age/adjusted age in months and days: \_\_\_\_\_  
 Administering program/provider: \_\_\_\_\_ Baby's gender:  Male  Female

**1. ASQ:SE-2 SCORING CHART:**

- Score items (Z = 0, V = 5, X = 10, Concern = 5).
- Transfer the page totals and add them for the total score.
- Record the baby's total score next to the cutoff.

|                        |  |        |             |
|------------------------|--|--------|-------------|
| TOTAL POINTS ON PAGE 1 |  | Cutoff | Total score |
| TOTAL POINTS ON PAGE 2 |  |        |             |
| TOTAL POINTS ON PAGE 3 |  |        |             |
| <b>Total score</b>     |  |        |             |

|    |  |
|----|--|
| 45 |  |
|----|--|

**2. ASQ:SE-2 SCORE INTERPRETATION:** Review the approximate location of the baby's total score on the scoring graphic. Then, check off the area for the score results below.



- The baby's total score is in the  area. It is below the cutoff. Social-emotional development appears to be on schedule.  
 The baby's total score is in the  area. It is close to the cutoff. Review behaviors of concern and monitor.  
 The baby's total score is in the  area. It is above the cutoff. Further assessment with a professional may be needed.

**3. OVERALL RESPONSES AND CONCERNS:** Record responses and transfer parent/caregiver comments. YES responses require follow-up.

- 1-23. Any Concerns marked on scored items?    YES    no    Comments: \_\_\_\_\_
24. Eating/sleeping concerns?    YES    no    Comments: \_\_\_\_\_
25. Other worries?    YES    no    Comments: \_\_\_\_\_

**4. FOLLOW-UP REFERRAL CONSIDERATIONS:** Mark all as Yes, No, or Unsure (Y, N, U). See pages 98-103 in the ASQ:SE-2 User's Guide.

- Setting/time factors (e.g., Is the baby's behavior the same at home as at school?)  
 Developmental factors (e.g., Is the baby's behavior related to a developmental stage or delay?)  
 Health factors (e.g., Is the baby's behavior related to health or biological factors?)  
 Family/cultural factors (e.g., Is the baby's behavior acceptable given the baby's cultural or family context? Have there been any stressful events in the baby's life recently?)  
 Parent concerns (e.g., Did the parent/caregiver express any concerns about the baby's behavior?)

**5. FOLLOW-UP ACTION:** Check all that apply.

- Provide activities and rescreen in \_\_\_\_\_ months.  
 Share results with primary health care provider.  
 Provide parent education materials.  
 Provide information about available parenting classes or support groups.  
 Have another caregiver complete ASQ:SE-2. List caregiver here (e.g., grandparent, teacher): \_\_\_\_\_  
 Administer developmental screening (e.g., ASQ-3).  
 Refer to early intervention/early childhood special education.  
 Refer for social-emotional, behavioral, or mental health evaluation.  
 Other: \_\_\_\_\_

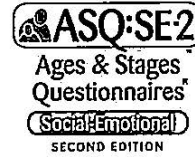
P201060500

Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
 © 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.



# 12 Month Questionnaire

9 months 0 days through 14 months 30 days



Date ASQ:SE-2 completed: \_\_\_\_\_

### Baby's information

Baby's first name: \_\_\_\_\_ Baby's middle initial: \_\_\_\_\_ Baby's last name: \_\_\_\_\_

Baby's date of birth: \_\_\_\_\_ If baby was born 3 or more weeks premature, please enter the number of weeks: \_\_\_\_\_

Baby's gender:  Male  Female

### Person filling out questionnaire

First name: \_\_\_\_\_ Middle initial: \_\_\_\_\_ Last name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State/province: \_\_\_\_\_ ZIP/postal code: \_\_\_\_\_

Country: \_\_\_\_\_ Home telephone number: \_\_\_\_\_ Other telephone number: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Relationship to baby:  Parent  Guardian  Teacher  Other: \_\_\_\_\_  
 Grandparent/other relative  Foster parent  Child care provider

People assisting in questionnaire completion: \_\_\_\_\_

### Program information (For program use only.)

|               |  |
|---------------|--|
| Baby's ID #:  | Age at administration in months and days:      |
| Program ID #: | If premature, adjusted age in months and days: |
| Program name: |  |

P201120000

Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly. © 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.



# 12 Month Questionnaire 9 months 0 days through 14 months 30 days



Questions about behaviors babies may have are listed on the following pages. Please read each question carefully and check the box  that best describes your baby's behavior. Also, check the circle  if the behavior is a concern.

**Important Points to Remember:**

- Answer questions based on what you know about your baby's behavior.
- Answer questions based on your baby's *usual* behavior, not behavior when your baby is sick, very tired, or hungry.
- Caregivers who know the baby well and spend more than 15–20 hours per week with the baby should complete ASQ:SE-2.
- Please return this questionnaire by: \_\_\_\_\_
- If you have any questions or concerns about your baby or about this questionnaire, contact: \_\_\_\_\_
- Thank you and please look forward to filling out another ASQ:SE-2 in \_\_\_\_\_ months.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |       |
|---|----------------------------|----------------------------|----------------------------|----------------------------|-------|
| 1. Does your baby laugh or smile at you and other family members?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 2. Does your baby look for you when a stranger comes near?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 3. Does your baby like to play near or be with family and friends?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 4. Does your baby like to be picked up and held?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 5. When upset, can your baby calm down within a half hour?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |
| 6. Does your baby stiffen and arch her back when picked up?   | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | _____ |
| 7. Does your baby like to play games such as Peekaboo?           | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | _____ |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 12 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |     |
|---|----------------------------|----------------------------|----------------------------|----------------------------|-----|
| 8. Is your baby's body relaxed?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | ___ |
| 9. Does your baby cry, scream, or have tantrums for long periods of time?   | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | ___ |
| 10. Is your baby able to calm himself down (for example, by sucking his hand or pacifier)?                                | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | ___ |
|   |                            |                            |                            |                            |     |
| 11. Is your baby interested in things around her, such as people, toys, and foods?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | ___ |
| 12. Does it take longer than 30 minutes to feed your baby?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | ___ |
| 13. Do you and your baby enjoy mealtimes together?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | ___ |
| 14. Does your baby have any eating problems, such as gagging, vomiting, or _____? (Please describe.)                      | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | ___ |
| _____   |                            |                            |                            |                            |     |
| _____   |                            |                            |                            |                            |     |
| 15. Does your baby have trouble falling asleep at naptime or at night?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | ___ |
| 16. Does your baby make babbling sounds? For example, does he put sounds together such as "ba-ba-ba-ba" or "na-na-na-na?" | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | ___ |

TOTAL POINTS ON PAGE \_\_\_

P201120200


Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
© 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.

page 2 of 4

# 12 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|----------------------------|----------------------------|----------------------------|----------------------------|---|
| 17. Does your baby sleep at least 10 hours in a 24-hour period?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 18. Does your baby get constipated or have diarrhea?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 19. Does your baby let you know when she is hungry, hurt, or tired?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 20. When you talk to your baby, does he turn his head, look, or smile?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 21. Does your baby try to hurt other children, adults, or animals (for example, by kicking or biting)?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 22. Does your baby try to show you things? For example, does she hold out a toy and look at you?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 23. Does your baby respond to his name when you call him? For example, does he turn his head and look at you?                                     | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 24. When you point at something, does your baby look in the direction you are pointing?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 25. Does your baby make sounds or use gestures to let you know she wants something (for example, by reaching)?                                    | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 26. When you copy sounds your baby makes, does your baby repeat the same sounds back to you?  | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 27. Has anyone shared concerns about your baby's behaviors? If "sometimes" or "often or always," please explain:<br>_____<br>_____<br>_____       | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 12 Month Questionnaire



**OVERALL** Use the space below for additional comments.

28. Do you have concerns about your baby's eating or sleeping behaviors? If yes, please explain:  YES  NO

---

---

---

29. Does anything about your baby worry you? If yes, please explain:  YES  NO

---

---

---

30. What do you enjoy about your baby?

---

---

---

# 12 Month Information Summary 9 months 0 days through 14 months 30 days



Baby's name: \_\_\_\_\_ Date ASQ:SE-2 completed: \_\_\_\_\_  
 Baby's ID #: \_\_\_\_\_ Baby's date of birth: \_\_\_\_\_  
 Person who completed ASQ:SE-2: \_\_\_\_\_ Baby's age/adjusted age in months and days: \_\_\_\_\_  
 Administering program/provider: \_\_\_\_\_ Baby's gender:  Male  Female

**1. ASQ:SE-2 SCORING CHART:**

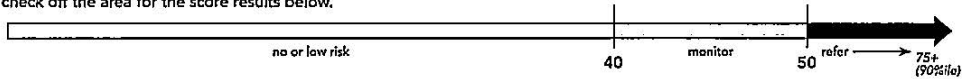
- Score items (Z = 0, V = 5, X = 10, Concern = 5).
- Transfer the page totals and add them for the total score.
- Record the baby's total score next to the cutoff.

|                        |  |        |             |
|------------------------|--|--------|-------------|
| TOTAL POINTS ON PAGE 1 |  | Cutoff | Total score |
| TOTAL POINTS ON PAGE 2 |  |        |             |
| TOTAL POINTS ON PAGE 3 |  |        |             |
| <b>Total score</b>     |  |        |             |

|    |
|----|
| 50 |
|----|

**2. ASQ:SE-2 SCORE INTERPRETATION:** Review the approximate location of the baby's total score on the scoring graphic. Then, check off the area for the score results below.



- \_\_\_ The baby's total score is in the  area. It is below the cutoff. Social-emotional development appears to be on schedule.  
 \_\_\_ The baby's total score is in the  area. It is close to the cutoff. Review behaviors of concern and monitor.  
 \_\_\_ The baby's total score is in the  area. It is above the cutoff. Further assessment with a professional may be needed.

**3. OVERALL RESPONSES AND CONCERNS:** Record responses and transfer parent/caregiver comments. YES responses require follow-up.

- 1-27. Any Concerns marked on scored items?    YES    no    Comments: \_\_\_\_\_
28. Eating/sleeping concerns?    YES    no    Comments: \_\_\_\_\_
29. Other worries?    YES    no    Comments: \_\_\_\_\_

**4. FOLLOW-UP REFERRAL CONSIDERATIONS:** Mark all as Yes, No, or Unsure (Y, N, U). See pages 98-103 in the ASQ:SE-2 User's Guide.

- \_\_\_ Setting/time factors (e.g., Is the baby's behavior the same at home as at school?)  
 \_\_\_ Developmental factors (e.g., Is the baby's behavior related to a developmental stage or delay?)  
 \_\_\_ Health factors (e.g., Is the baby's behavior related to health or biological factors?)  
 \_\_\_ Family/cultural factors (e.g., Is the baby's behavior acceptable given the baby's cultural or family context? Have there been any stressful events in the baby's life recently?)  
 \_\_\_ Parent concerns (e.g., Did the parent/caregiver express any concerns about the baby's behavior?)

**5. FOLLOW-UP ACTION:** Check all that apply.

- \_\_\_ Provide activities and rescreen in \_\_\_ months.  
 \_\_\_ Share results with primary health care provider.  
 \_\_\_ Provide parent education materials.  
 \_\_\_ Provide information about available parenting classes or support groups.  
 \_\_\_ Have another caregiver complete ASQ:SE-2. List caregiver here (e.g., grandparent, teacher): \_\_\_\_\_  
 \_\_\_ Administer developmental screening (e.g., ASQ-3).  
 \_\_\_ Refer to early intervention/early childhood special education.  
 \_\_\_ Refer for social-emotional, behavioral, or mental health evaluation.  
 \_\_\_ Other: \_\_\_\_\_

P201120500

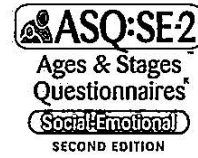
Agos & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
 © 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.





# 18 Month Questionnaire

15 months 0 days through 20 months 30 days



Date ASQ:SE-2 completed: \_\_\_\_\_

### Child's information

Child's first name: \_\_\_\_\_ Child's middle initial: \_\_\_\_\_ Child's last name: \_\_\_\_\_

Child's date of birth: \_\_\_\_\_ If child was born 3 or more weeks premature, please enter the number of weeks: \_\_\_\_\_

Child's gender:  Male  Female

### Person filling out questionnaire

First name: \_\_\_\_\_ Middle initial: \_\_\_\_\_ Last name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State/province: \_\_\_\_\_ ZIP/postal code: \_\_\_\_\_

Country: \_\_\_\_\_ Home telephone number: \_\_\_\_\_ Other telephone number: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Relationship to child:  Parent  Guardian  Teacher  Other: \_\_\_\_\_  
 Grandparent/other relative  Foster parent  Child care provider

People assisting in questionnaire completion: \_\_\_\_\_

### Program information (For program use only.)

|               |  |
|---------------|--|
| Child's ID #: | Age at administration in months and days:      |
| Program ID #: | If premature, adjusted age in months and days: |
| Program name: |  |

P201180000

Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly. © 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.


# 18 Month Questionnaire 15 months 0 days through 20 months 30 days



Questions about behaviors children may have are listed on the following pages. Please read each question carefully and check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

**Important Points to Remember:**

- Answer questions based on what you know about your child's behavior.
- Answer questions based on your child's *usual* behavior, not behavior when your child is sick, very tired, or hungry.
- Caregivers who know the child well and spend more than 15–20 hours per week with the child should complete ASQ:SE-2.
- Please return this questionnaire by: \_\_\_\_\_
- If you have any questions or concerns about your child or about this questionnaire, contact: \_\_\_\_\_
- Thank you and please look forward to filling out another ASQ:SE-2 in \_\_\_\_\_ months.

|  | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|--|----------------------------|----------------------------|----------------------------|----------------------------|---|
| 1. Does your child look at you when you talk to him?                               | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 2. When you leave, does your child stay upset and cry for more than an hour?       | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 3. Does your child laugh or smile when you play with her?                          | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
|  |                            |                            |                            |                            |   |
| 4. Does your child look for you when a stranger comes near?                        | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 5. Is your child's body relaxed?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 6. Does your child like to be hugged or cuddled?                                   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 7. When upset, can your child calm down within 15 minutes?                         | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 18 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS                       | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|---------------------------------------|----------------------------|----------------------------|----------------------------|---|
| 8. Does your child stiffen and arch his back when picked up?  | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 9. Does your child cry, scream, or have tantrums for long periods of time?  | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 10. Is your child interested in things around her, such as people, toys, and foods?   | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 11. Does your child do things over and over and get upset when you try to stop him? For example, does he rock, flap his hands, spin, or _____? (Please describe.)<br>_____<br>_____ | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 12. Does your child have eating problems? For example, does she stuff food, vomit, eat things that are not food, or _____? (Please describe.)<br>_____<br>_____                     | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 13. Does your child have trouble falling asleep at naptime or at night?   | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 14. Do you and your child enjoy mealtimes together?   | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 15. Does your child sleep at least 10 hours in a 24-hour period?  | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 16. When you point at something, does your child look in the direction you are pointing?  | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 18 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS                       | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|---------------------------------------|----------------------------|----------------------------|----------------------------|---|
| 17. Does your child get constipated or have diarrhea?   | <input checked="" type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 18. Does your child let you know how he is feeling with gestures or words? For example, does he let you know when he is hungry, hurt, or tired? | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 19. Does your child follow simple directions? For example, does she sit down when asked?  | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 20. Does your child like to play near or be with family and friends?  | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 21. Does your child check to make sure you are near when exploring new places, such as a park or a friend's home?                               | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 22. Does your child like to hear stories or sing songs?   | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
|   |                                       |                            |                            |                            |   |
| 23. Does your child hurt himself on purpose?  | <input type="checkbox"/> x            | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 24. Does your child like to be around other children? For example, does she move close to or look at other children?                            | <input type="checkbox"/> z            | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
|   |                                       |                            |                            |                            |   |
| 25. Does your child try to hurt other children, adults, or animals (for example, by kicking or biting)?   | <input type="checkbox"/> x            | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

P201180300

Ages & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
© 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.

page 3 of 5

# 18 Month Questionnaire



Check the box  that best describes your child's behavior. Also, check the circle  if the behavior is a concern.

|   | OFTEN OR ALWAYS            | SOME-TIMES                 | RARELY OR NEVER            | CHECK IF THIS IS A CONCERN |   |
|---|----------------------------|----------------------------|----------------------------|----------------------------|---|
| 26. Does your child try to show you things by pointing at them and looking back at you?   | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 27. Does your child make sounds or use words or gestures to let you know he wants something (for example, by reaching)?                             | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 28. Does your child play with objects by pretending? For example, does your child pretend to talk on the phone, feed a doll, or fly a toy airplane? | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 29. Does your child wake three or more times during the night?  | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |
| 30. Does your child respond to her name when you call her? For example, does she turn her head and look at you?                                     | <input type="checkbox"/> z | <input type="checkbox"/> v | <input type="checkbox"/> x | <input type="radio"/> v    | — |
| 31. Has anyone shared concerns about your child's behaviors? If "sometimes" or "often or always," please explain:<br>_____<br>_____<br>_____        | <input type="checkbox"/> x | <input type="checkbox"/> v | <input type="checkbox"/> z | <input type="radio"/> v    | — |

TOTAL POINTS ON PAGE \_\_\_\_\_

# 18 Month Questionnaire



**OVERALL** Use the space below for additional comments.

32. Do you have concerns about your child's eating or sleeping behaviors? If yes, please explain:  YES  NO

---

---

---

33. Does anything about your child worry you? If yes, please explain:  YES  NO

---

---

---

34. What do you enjoy about your child?

---

---

---

# 18 Month Information Summary 15 months 0 days through 20 months 30 days



Child's name: \_\_\_\_\_ Date ASQ:SE-2 completed: \_\_\_\_\_  
 Child's ID #: \_\_\_\_\_ Child's date of birth: \_\_\_\_\_  
 Person who completed ASQ:SE-2: \_\_\_\_\_ Child's age/adjusted age in months and days: \_\_\_\_\_  
 Administering program/provider: \_\_\_\_\_ Child's gender:  Male  Female

**1. ASQ:SE-2 SCORING CHART:**

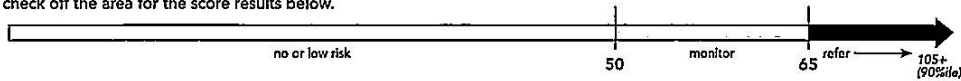
- Score items (Z = 0, V = 5, X = 10, Concern = 5).
- Transfer the page totals and add them for the total score.
- Record the child's total score next to the cutoff.

|                        |  |        |             |
|------------------------|--|--------|-------------|
| TOTAL POINTS ON PAGE 1 |  | Cutoff | Total score |
| TOTAL POINTS ON PAGE 2 |  |        |             |
| TOTAL POINTS ON PAGE 3 |  |        |             |
| TOTAL POINTS ON PAGE 4 |  |        |             |
| <b>Total score</b>     |  |        |             |

|    |  |
|----|--|
| 65 |  |
|----|--|

**2. ASQ:SE-2 SCORE INTERPRETATION:** Review the approximate location of the child's total score on the scoring graphic. Then, check off the area for the score results below.



- \_\_\_ The child's total score is in the  area. It is below the cutoff. Social-emotional development appears to be on schedule.  
 \_\_\_ The child's total score is in the  area. It is close to the cutoff. Review behaviors of concern and monitor.  
 \_\_\_ The child's total score is in the  area. It is above the cutoff. Further assessment with a professional may be needed.

**3. OVERALL RESPONSES AND CONCERNS:** Record responses and transfer parent/caregiver comments. YES responses require follow-up.

- 1-31. Any Concerns marked on scored items?    YES    no    Comments:  
  
 32. Eating/sleeping concerns?    YES    no    Comments:  
 33. Other worries?    YES    no    Comments:

**4. FOLLOW-UP REFERRAL CONSIDERATIONS:** Mark all as Yes, No, or Unsure (Y, N, U). See pages 98-103 in the ASQ:SE-2 User's Guide.

- \_\_\_ Setting/time factors (e.g., Is the child's behavior the same at home as at school?)  
 \_\_\_ Developmental factors (e.g., Is the child's behavior related to a developmental stage or delay?)  
 \_\_\_ Health factors (e.g., Is the child's behavior related to health or biological factors?)  
 \_\_\_ Family/cultural factors (e.g., Is the child's behavior acceptable given the child's cultural or family context? Have there been any stressful events in the child's life recently?)  
 \_\_\_ Parent concerns (e.g., Did the parent/caregiver express any concerns about the child's behavior?)

**5. FOLLOW-UP ACTION:** Check all that apply.

- \_\_\_ Provide activities and rescreen in \_\_\_ months.  
 \_\_\_ Share results with primary health care provider.  
 \_\_\_ Provide parent education materials.  
 \_\_\_ Provide information about available parenting classes or support groups.  
 \_\_\_ Have another caregiver complete ASQ:SE-2. List caregiver here (e.g., grandparent, teacher): \_\_\_\_\_  
 \_\_\_ Administer developmental screening (e.g., ASQ-3).  
 \_\_\_ Refer to early intervention/early childhood special education.  
 \_\_\_ Refer for social-emotional, behavioral, or mental health evaluation.  
 \_\_\_ Other: \_\_\_\_\_

P201180600

Agos & Stages Questionnaires®: Social-Emotional, Second Edition (ASQ:SE-2™), Squires, Bricker, & Twombly.  
 © 2015 Paul H. Brookes Publishing Co., Inc. All rights reserved.

APPENDIX D  
IRB EXEMPTION





This activity is not research so 45 CFR part 46 does not apply. To see the regulation [45 CFR 46.102(l)] [click here](#).

Other Federal, State, and local laws and/or regulations may apply to the activity.



NOT HUMAN SUBJECTS RESEARCH DETERMINATION

[Elizabeth Reifsnider](#)

602/496-1394  
Elizabeth.Reifsnider@asu.edu

Dear [Elizabeth Reifsnider](#):

On 3/29/2024 the ASU IRB reviewed the following protocol:

|                     |   |
|---------------------|---|
| Type of Review:     | Initial Study   |
| Title:              | Investigating the Relationship Between Maternal Depression, Infant Social and Emotional Development, and Maternal Role Satisfaction |
| Investigator:       | <a href="#">Elizabeth Reifsnider</a>  |
| IRB ID:             | STUDY00019887   |
| Funding:            | None  |
| Grant Title:        | None  |
| Grant ID:           | None  |
| Documents Reviewed: | • IRB Wizard, Category: IRB Protocol;   |

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

IRB review and approval by Arizona State University is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether the activities would change the determination, contact the IRB at [research.integrity@asu.edu](mailto:research.integrity@asu.edu) to determine the next steps.

Sincerely,

IRB Administrator

cc: Autumn Argent

Autumn Argent