PSYCHOMETRIC PROPERTIES OF THE VIDEO VIGNETTES SENSITIVE PARENTING ASSESSMENT FOR PARENTS OF INFANTS

by

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ABSTRACT

Sensitive parenting, involving prompt and appropriate responses to infant cues, is critical to children's development. The two components of sensitive parenting, sensitivity to infant cues of non-distress and nurturance in response to infant cues of distress, have been widely researched over the last several decades and are often the target of parenting interventions. Despite their popularity in research and clinical domains, measurement of sensitivity and nurturance typically involves behavioral coding of recorded parent-infant interactions, which requires time, training, and expertise. To address this issue, we developed the Video Vignettes Sensitive Parenting Assessments – Infant (VVSPA-I), a brief, vignettes-based measure meant to measure sensitivity and nurturance efficiently. In the current study, we examined the factor structure, internal consistency, and construct validity of the VVSPA-I. We hypothesized that a two-factor model would be the best fit, that the two scales would demonstrate good internal consistency, and that the sensitivity and nurturance scores would be correlated with observed sensitivity, intrusiveness, and nurturance. Indeed, a two-factor solution emerged superior to a one-factor solution and the sensitivity scale scores correlated with observed sensitivity and intrusiveness, while the nurturance scale scores correlated with observed nurturance. However, the measure did not demonstrate good internal consistency and some factor loadings were too small or too large. In addition, further examination of response patterns on individual items revealed high variability in responses across items (i.e., some questions were too easy, some were too difficult). We concluded that the VVSPA-I is not yet psychometrically

sound and that there are several changes to be made to the item before it may be used with confidence.

Chapter 1

INTRODUCTION

In her landmark study of Ugandan mother-infant dyads, Mary Ainsworth (1967) spent hundreds of hours observing 28 dyads interacting throughout the day. Following these intense observations, Ainsworth identified four characteristics indicative of high-quality parenting: 1. Sensitivity; 2. Cooperation with baby's behavior; 3. Physical and psychological availability; and 4. Acceptance of baby's needs (Ainsworth, 1969). This conceptualization of high-quality parenting laid the groundwork for decades of research in the fields of developmental psychology and developmental psychopathology. Of the four characteristics of high-quality parenting proposed by Ainsworth, sensitivity, referred to as sensitive parenting from this point on, has received the most attention both within research and intervention (Bakermans-Kranenburg et al., 2003; Bernard et al., 2013; Bernier et al., 2010; Bretherton, 2013; Dozier & Bernard, 2019; Hane & Fox, 2006; Hoffman et al., 2006; Juffer et al., 2005; McElwain & Booth-LaForce, 2006; Mesman & Emmen, 2013; Pianta et al., 1989; Posada et al., 2002).

According to Ainsworth, a mother who engages in sensitive parenting is one who is aware of her infant's signals, accurately interprets them, and responds quickly and appropriately to them (Ainsworth, 1969). Sensitivity to infant cues has been found to predict attachment (McElwain & Booth-LaForce, 2006; Smith & Pederson, 1988;

Susman-Stillman et al., 1996) as well as other critical child outcomes including self regulation (Conradt & Ablow, 2010; Frick et al., 2018; Ispa et al., 2017), executive function (Bernier et al., 2010, 2012), and neural development (Bernier et al., 2019; Kok et al., 2015; Wang et al., 2019). Further, sensitive parenting has been found to buffer the negative effects of adversity on children (Farrell et al., 2017; Lind et al., 2021; Miller et al., 2011) and has thus been targeted in interventions for children experiencing adversity such as poverty, maltreatment, and neglect (e.g., Cicchetti et al., 1999; Dozier & Bernard, 2019; Hoffman et al., 2006; Juffer et al., 2005). Despite the focus on sensitivity within research and intervention, there is no efficient way to measure sensitive parenting (Mesman & Emmen, 2013). Sensitivity is most often measured via observational instruments that require extensive training and time. Therefore, the current study aims to present and evaluate a brief measure that assesses sensitive parenting using vignettes and multiple-choice responses.

1.1 Sensitivity and Nurturance: Two Distinct Constructs

Although Ainsworth described sensitive parenting as involving contingent responses to both infant distress and non-distress, others tend to separate the two into distinct constructs: sensitivity and nurturance (Bernard et al., 2013; Leerkes et al., 2012). For clarity, sensitivity will henceforth refer to responses to infant non-distress and nurturance will refer to responses to infant distress. Sensitivity involves responding contingently and appropriately to infants' cues of non-distress (Bernard et

al., 2013). This back-and-forth dynamic led by the infant has been termed "serve and return," (Shonkoff & Bales, 2011) where the infant "serves" and the parent "returns." This is also referred to as the parent "following the [child's] lead" (Bernard et al., 2013; Dozier & Bernard, 2019).

Nurturance involves responding to infant cues of distress in a timely and comforting manner, ultimately providing a "haven of safety," as described by John Bowlby (1982). Prior research that has examined sensitivity and nurturance as distinct constructs has found that each predicts different child outcomes (Lee et al., 2020; Leerkes et al., 2012; McElwain & Booth-LaForce, 2006). For example, Leerkes et al. (2009) found that observed nurturance during free-play interactions when infants were 6 months old predicted parent-reported behavior problems and social competence when infants were 24 and 36 months old. This effect was found for nurturance above and beyond sensitivity. Lee et al. (2020) found that sensitivity, but not nurturance, during a free-play interaction when children were 6 to 12 months old, mediated the association between sociodemographic risk and child language ability at 12-22 months.

1.2 Measurement of Sensitivity and Nurturance

Given their importance in predicting child outcomes, sensitivity and nurturance have been heavily emphasized both in research and intervention. Whether researched as two separate constructs or one, sensitivity and nurturance have been the focus of hundreds of studies and dozens of parenting interventions (see Deans, 2020 for a

recent review). Sensitive parenting is most often measured via observation and behavioral coding. There are at least nine different coding schemes mentioned in the literature that have been used to measure sensitivity over the last few decades (see Mesman & Emmen, 2013 for a review). Such coding schemes often require intensive training and expertise, thus draining laboratory and/or organization resources. Despite the amount of resources required, coding sensitive parenting is still an integral part of intervention evaluation. For example, the Attachment and Biobehavioral Catch-up (ABC) intervention uses filmed semi-structured play assessments to assess pre- and post-intervention sensitivity. These videos are sent to the University of Delaware to be coded by reliable coders (Roben et al., 2021). ABC is provided in over 20 states and 7 countries besides the United States (abcintervention.org/families), producing a steady, heavy stream of sensitivity assessments for coders at the University of Delaware to code.

Nurturance may be even more difficult to measure than sensitivity, given that it can only be measured when infants are distressed. Therefore, nurturance is typically coded in the context of distressing events. For example, researchers may code parental behavior during research tasks that are distressing to infants, such as the Still-Face Paradigm (Tronick et al., 1978) or the Strange Situation (Ainsworth et al., 1978). However, some studies suggest that children display different levels of distress during these tasks given their different experiences with parental responsiveness (see Mesman et al., 2009 for a review of variability in responses to the Still-Face Paradigm; Ainsworth et al., 1978). Certain tasks from the Laboratory Temperament

Assessment Battery (Lab-TAB; Planalp et al., 2017) are designed to elicit fear or frustration in infants and are thus used to code nurturance (Hepworth et al., 2020). Similarly to those used to measure sensitivity, such tasks require resources that program evaluators may not have.

To our knowledge, there is currently no valid self-report measure assessing sensitive parenting. Leerkes & Qu (2017) developed a self-report questionnaire assessing maternal responsiveness, an important aspect of sensitive parenting, but it does not fully encompass all the important aspects of sensitivity and nurturance, such as appropriateness of the response and attention to infant cues of non-distress. This questionnaire includes 68 items that ask how responsive mothers are to their infants in seven different contexts involving infant distress. The questions focused on the latency to response and the authors theorized three subscales: 1) responsiveness (i.e., quick response to crying); 2) non-responsiveness (i.e., slow or no response to crying); and 3) delayed responsiveness. The three scales had good internal consistency and test-retest reliability, but only the non-responsiveness scale demonstrated convergent and predictive validity. Taken together, this study demonstrates that a questionnaire that assesses sensitive parenting is still wanting.

1.3 The Current Study

The aim of the current study was to develop and validate a brief measure that accurately and efficiently assesses sensitivity and nurturance. With the guidance of experts in the field, we developed a brief questionnaire that prompts parents to report

on how they would respond in potential parenting scenarios. We carefully selected video clips that depict scenarios meant to elicit sensitivity and nurturance and then developed five potential responses for each scenario. In this study, we assessed the factor structure of the measure using confirmatory factor analysis (CFA) and examined internal consistency reliability for each of the two subscales. We hypothesized that a two-factor model would demonstrate the best fit and that each of the subscales would demonstrate good internal consistency reliability. In addition, we assessed convergent validity by examining the associations between the sensitivity subscale and observed sensitivity during a free-play task when infants were 12 months old, and between the nurturance subscale and observed nurturance during an infant simulator task. We hypothesized that each subscale would correlate positively with its behavioral counterpart. Finally, we assessed divergent validity of the sensitivity subscale by examining associations between the sensitivity subscale and observed intrusiveness during a free-play task when infants were 12 months old. We hypothesized that the sensitivity subscale would correlate negatively with observed intrusiveness.

Chapter 2

METHODS

2.1 Participants

Participants in the study were women enrolled in a randomized clinical trial assessing the effectiveness of a parenting intervention aimed at improving maternal sensitivity and nurturance amongst women dependent on opioids. Pregnant women were recruited via Craigslist and Facebook ads, as well as at local treatment centers offering medication-assisted treatment (MAT) for opioid dependence. Pregnant women in their third trimester or up to one month postpartum receiving MAT were randomized to receive either the target intervention, modified Attachment and Biobehavioral Catch-up (mABC), or the control intervention, modified Developmental Education for Families (mDEF; original DEF described in Dozier et al., 2009). Pregnant women in their third trimester or up to one month postpartum who used substances during pregnancy (exclusive of opioids) were allocated to the polysubstance comparison group. Pregnant women in their third trimester or up to one month postpartum who did not use substances and were not involved with Child Protective Services (CPS) during pregnancy were allocated to the healthy comparison group. Information about the number of participants in each group can be found in Table 1 and demographic information can be found in Table 2.

Table 1. *Group Information*

	n	**%**
Assessment timepoint		
12-month follow-up	56	53.3
Pre-intervention/prenatal	49	46.7
Group		
mABC (MAT), 12-month	23	21.9
mDEF (MAT), 12-month	18	17.1
MAT, pre-intervention	22	21.0
Polysubstance	23	21.9
Comparison	19	18.1

Table 2. *Sample Characteristics*

	n	**%**
Gender, Female	96	91.4
Not reported	9	8.6
Currently pregnant	35	33.3
Race*		
American Indian or Native Alaskan	4	3.8
African American	29	27.6
White	63	60
Other	8	7.6
Ethnicity		
Hispanic	10	9.5
Not reported	9	8.6
Education		
Less than high school	18	17.1
High school or equivalent (GED)	31	29.5
Some college	24	22.9
Associate degree	7	6.7
Bachelor's degree	3	2.9
Master's degree	7	6.7
Technical school certificate	6	5.7
Not reported	9	8.6
Marital status, at enrollment		
Married or domestic partnership	32	30.5
Widowed	1	1
Divorced	6	5.7

Separated	3	2.9
Single	55	52.4
Not reported	8	7.6
Income (per year)		
< $10,000	27	25.7
$10,000 – $19,999	17	16.2
$20,000 – $34,999	20	19
$35,000 – $49,999	14	13.3
$50,000 – $74,999	13	12.4
$75,000 - $99,999	3	2.9
Not reported	11	10.5
	Mean (*SD*)	**Min – Max**
Age at assessment	30.7 (6.8)	19.9-63.6
Number of children	2.3 (1.4)	0-7

2.2 Procedure

During the third trimester of pregnancy or up to the first month postpartum (T1), participants completed self-report questionnaires and a laboratory visit including the Video Vignettes measure and an infant simulator task. At 12-months postpartum (T2), participants completed questionnaires and a laboratory visit including the Video Vignettes measure and a free-play assessment with their infant. Forty-nine women completed the Video Vignettes measure and infant simulator task at T1, and 56 women completed the measure and free-play assessment at T2 (n = 105). There was no overlap between participants who completed the measure at T1 and those who completed it at T2.

Chapter 3

MEASURES

3.1 Video Vignettes Sensitive Parenting Assessment – Infant (VVSPA-I)

The VVSPA-I aims to efficiently assess nurturance and parental sensitivity amongst parents of infants. We selected four video clips of distressed infants and four video clips of non-distressed infants interacting with their mothers for the measure. Infants in the videos ranged from 6 months to 12 months of age and were of various racial backgrounds. A short description was created for each of the distressed videos (e.g., "Baby wants to see grandma, but she is on a phone call in the other room") to provide context for why the infant in the video is distressed. Each video is followed by the question, "What would you do?" and five response options (Appendix A). Each set of options originally included one correct sensitive or nurturing answer. The correct answers were based on the definitions and characteristics of sensitivity and nurturance outlined in the ABC intervention manual (Dozier & The Infant-Caregiver Project Lab, 2012). Following data collection and prior to analyses, we decided to count two responses as correct on items 2 and 3 of the sensitivity scale due to their having somewhat sensitive properties.

During T1 and T2, participants completed the VVSPA-I via Qualtrics as part of their laboratory visit. Participants viewed the eight videos depicting various

scenarios involving infants and were asked to choose what they would do if they were the parent in the scenario. The order of the videos was randomized using a random number generator and was then presented in that order to each participant. Following each video, participants were prompted with the question, "What would you do?" and were asked to listen to the response options. Participants were then asked to choose one of five responses. Each question received a score of 0 or 1 based on correctness and a mean score was calculated for each scale. Scale scores ranged from 0-1, with 0 indicating low levels of nurturance or sensitivity and 1 indicating high levels of nurturance or sensitivity. The mean and standard deviation of the VVSPA-I scores can be found in Table 6.

3.2 Construct Validity Measures

To evaluate the convergent validity of the VVSPA-I, we measured participants' nurturance and sensitivity via behavioral observation and coding. To evaluate the divergent validity of the VVSPA-I sensitivity scale, we measured participants' intrusiveness via behavioral observation and coding.

3.2.1 Nurturance

Participants completed an infant simulator task at T1 to assess nurturance. Participants were instructed to take care of a realistic, racially ambiguous baby doll named Jordan for ten minutes and were asked to take care of the baby as if it were

their own. In addition, participants were told that they could do anything to soothe Jordan besides changing the baby's diaper. A ten-minute audio clip of infant vocalizations was played through a speaker embedded in the doll. Over the course of the ten minutes, the vocalizations became increasingly distressed in order to elicit nurturing behavior.

Trained students used video recordings of the task to code nurturance on a 1-5 scale, with 1 indicating low levels of nurturance and 5 indicating high levels of nurturance (Dozier & The Infant-Caregiver Project Lab, 2012; Voorthuis et al., 2013). A high score of nurturance was awarded to women who responded quickly and appropriately to most of Jordan's signals of distress. Women scored high on nurturance were persistent in their attempts to nurture, taking time with each attempt rather than responding half-heartedly. Contrarily, women were awarded a low nurturance score if they did not exhibit an awareness of distress signals, if they heavily dismissed Jordan's distress (e.g. woman says, "stop crying, you're okay"), or if they mainly attempted to distract Jordan and "fix" the crying without offering physical and/or verbal comfort. All videos (n = 51) were double coded in order to assess interrater reliability. Coders' scores were averaged to calculate the final nurturance scores. The intra-class correlation (ICC) was .53, which is considered moderate (Koo & Li, 2016). The mean and standard deviation of the nurturance scores can be found in Table 6.

3.2.2 Sensitivity and Intrusiveness

Participants completed a free-play task with their infants at the 12-month follow-up to assess maternal sensitivity. Participants were instructed to play as they "normally would" for ten minutes and were provided with a standardized set of toys including a soft picture book, a xylophone, stacking cups, and a rattle. Participants who were unable to attend the laboratory in person (n = 4, 7.1%) were recorded playing with their infants at home using a similar set of toys via a video-chatting platform. The recorded interactions were later coded by trained undergraduate research assistants. Sensitivity to non-distress and intrusiveness were coded using a coding scheme based on the Qualitative Scales of the Observational Ratings of the Caregiving Environment (ORCE; NICHD Early Child Care Research Network, 1996). Scales ranged from 1-5, with 1 indicating low levels of the coded behavior and 5 indicating high levels of the coded behavior.

Mothers were awarded a high sensitivity score if they responded contingently to child cues, followed the child's lead, and allowed the interaction to remain "child centered" (Bernard et al., 2013). Mothers received low sensitivity scores if they often did not respond contingently to the child, did not follow the child's lead, controlled the pace of play, or attempted to control the play based on their own ideas (rather than the child's) using verbal or physical intrusiveness (e.g., mother says, "let's stack the cups this way now"). Mothers additionally received low sensitivity scores if they appeared detached, played on their own or ignored child cues of non-distress. Mothers received high intrusiveness scores if they behaved in a verbally/physically controlling or

overstimulating manner. All videos (n = 43) were double coded in order to assess interrater reliability. Coders' scores were averaged to calculate the final sensitivity and intrusiveness scores. One-way random intra-class coefficients for maternal sensitivity and intrusiveness were .79 and .73, which are considered good and moderate, respectively (Koo & Li, 2016). The mean and standard deviation of the sensitivity scores can be found in Table 6.

3.3 Data Analyses

To evaluate the hypothesized factor structure of the VVSPA-I, we employed confirmatory factor analysis (CFA) using Mplus (Muthén & Muthén 2017). We used the robust weighted least squares (WLSMV) estimator which calculates robust standard errors and a mean and variance adjusted test-statistic. This estimator additionally uses polychoric correlations and is most appropriate for categorical items with a non-normal distribution (Flora & Curran, 2004). Fit indices including the root mean-square error of approximation (RMSEA), comparative fit index (CFI), Tucker Lewis index (TLI), and the model chi-square statistic were used to evaluate the model fit. CFI and TLI values of 0.95 and and RMSEA values of 0.5 or lower indicate good fit (Hu & Bentler, 1999). Current research indicates that these fit indices may be biased in analyses involving categorical data, and so we additionally examined standardized factor loadings to evaluate model fit.

To assess construct validity, we examined associations between the sensitivity scale of the VVSPA-I and behavioral sensitivity and intrusiveness scores from the

free-play interaction. In addition, we examined associations between the nurturance scale of the VVSPA-I and observed nurturance during the infant simulator task.

Chapter 4

RESULTS

4.1 Confirmatory Factor Analysis

4.1.1 Two-factor Solution

CFA was conducted on the hypothesized two-factor solution and on the alternative one-factor solution. CFA of the two-factor solution of the VVSPA-I revealed good fit to the model across multiple model fit indices (see Table 4 for fit statistics from CFA). The chi-square statistic was non-significant ($\chi^2 = 20.41$, $p = .371$), the CFI was above 0.95 (CFI = 0.969), the TLI was above 0.95 (TLI = .954), and the RMSEA was below 0.05 (RMSEA = 0.03). Despite the generally good model fit indices, standardized factor loadings varied greatly, with some very small and some very large (Table 3). In particular, factor loadings for items 2 and 3 of the sensitivity scale were very low (sensitivity 2 = -.140, sensitivity 3 = .016), indicating that these items were not explained by the factor, and item 3 of the nurturance scale was above 1 (nurturance 3 = 1.06), which is uncommon. When these three items were deleted, the program was unable to compute standard errors and was unable to provide certain fit indices. Thus, this alternate two-factor model was not considered.

Table 3. *Standardized factor loadings from the two-factor CFA*

Scale	Item 1	Item 2	Item 3	Item 4
Sensitivity	.835*	-.140	.016	.666*
Nurturance	.334*	.441*	1.06*	.436*

*$p < .05$

4.1.2 One-factor Solution

CFA of the one-factor solution revealed poor fit to the model. Poor fit indices included the CFI under 0.95 (CFI = .797), TLI under .095 (TLI = .716), and RMSEA above 0.05 (RMSEA = .07). The chi-square statistic ($\chi 2 = 29.19$, $p = .084$) provided support for this model. Chi square difference testing revealed a significantly better fit for the two-factor model ($\chi 2 = 6.18$, $df = 1$, $p = .013$), therefore, the original two-factor solution was used in the following analyses.

Table 4. *CFA model fit indices*

Model	**Chi square**	***df***	***p***	**RMSEA**	**CFI**	**TLI**
Two-factor solution	20.41	19	.371	.03	.969	.954
One-factor solution	29.19	20	.084	.07	.797	.716

4.2 Internal Consistency

Based on the results of the factor analysis, we proceeded with the original hypothesized two-factor model. The internal consistency of the sensitivity and nurturance scales was assessed using the Kuder-Richardson 20 (KR-20; Feldt, 1965) formula, which is used to assess measures with dichotomous items in SPSS 26 (IBM

SPSS Statistics for Mac, version 26). Both the sensitivity and nurturance scales showed poor internal consistency (sensitivity = .257, nurturance = .452).

4.3 Construct Validity

The correlations of the VVSPA-I subscale scores with observed parenting behaviors are presented in Table 5. In line with our hypothesis, the VVSPA-I sensitivity scores correlated positively with observed sensitivity (r = 0.355, p = .019) and correlated negatively with observed intrusiveness (r = -0.377, p = .013) at the 12-month follow-up. Contrary to our hypothesis, VVSPA-I nurturance scores did not correlate with observed nurturance at the prenatal laboratory visit (r = -0.067, p = .639).

Table 5. *Correlations between study variables*

Measure	1	2	3	4
1. Sensitivity, vignettes	-	-	-	-
2. Nurturance, vignettes	.233	-	-	-
3. Sensitivity, 12-month follow-up	.355*	-.044	-	-
4. Intrusiveness, 12-month follow-up	-.377*	.047	-.659**	-
5. Nurturance, pre-intervention/prenatal	.917	-.067	-.151	.054

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

4.4 Descriptive Statistics

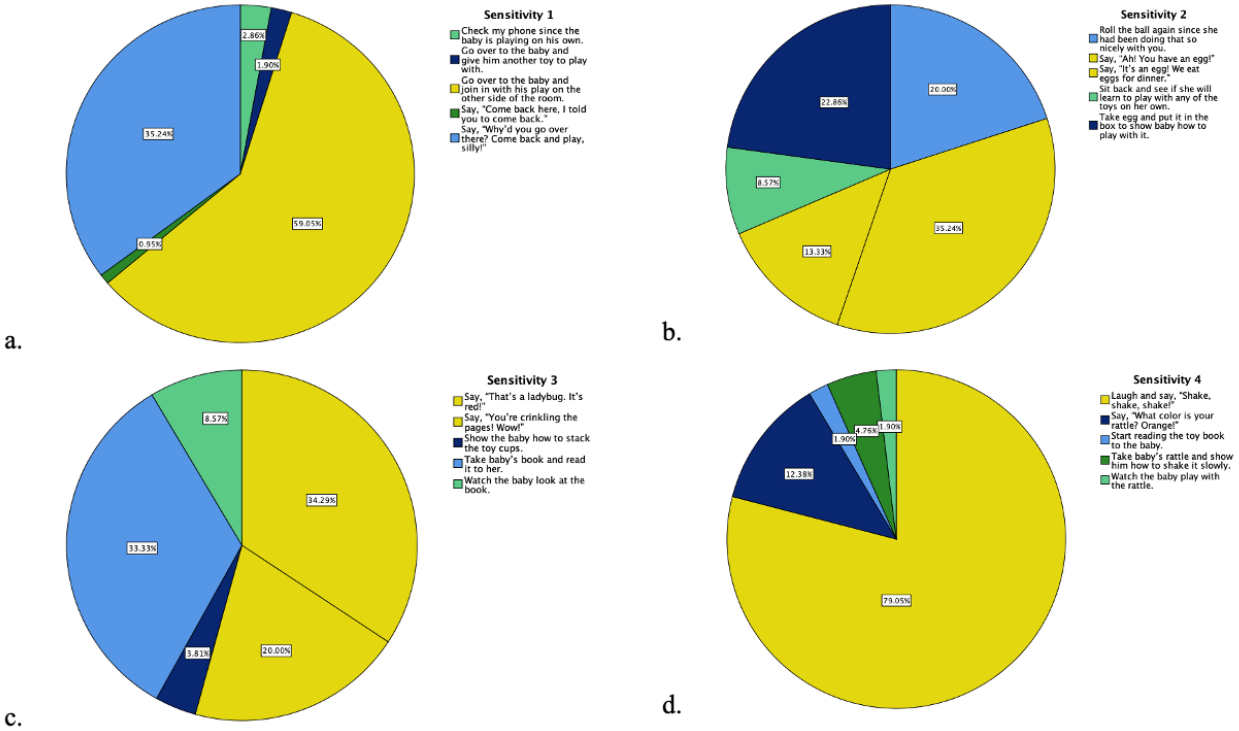
Examination of responses to individual items provided insight into response patterns on the VVSPA-I (Figure 1). Of note, certain items had highly variable response patterns whereas others had low variability in responses. Sensitivity and

nurturance subscale scores were calculated by averaging the four items in each subscale. Means and standard deviations for each item, as well as for subscale scores and other study variables of interest, can be found in Table 6. The sensitivity and nurturance subscales were not significantly correlated (r = .117, p = .233).

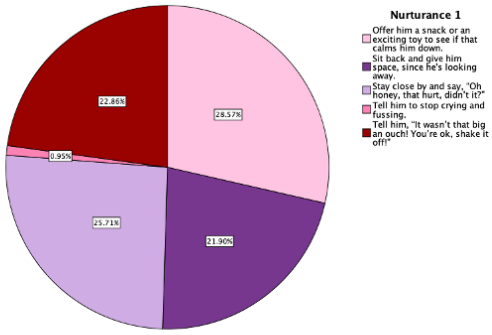
Table 6. *Descriptive statistics of study variables*

	n	**Min-Max**	**Mean (*SD*)**
Sensitivity, vignettes	105	0-1	.6 (.27)
Nurturance, vignettes	105	0-1	.47 (.30)
Sensitivity, 12-month follow-up	43	1-5	2.7 (.92)
Intrusiveness, 12-month follow-up	43	1-4.5	2.4 (.93)
Nurturance, pre-intervention/prenatal	51	1-4.25	2.6 (.66)

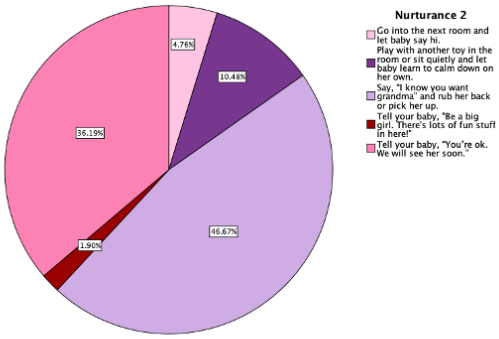
Figure 1. *Responses to Individual Items on the VVSPA-I*



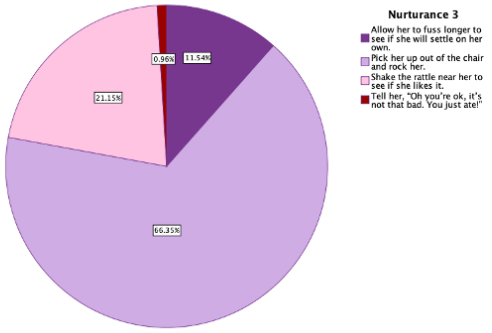
e.


Nurturance 1
Offer him a snack or an exciting toy to see if that calms him down.
Sit back and give him space, since he's looking away.
Stay close by and say, "Oh honey, that hurt, didn't it?"
Tell him to stop crying and fussing.
Tell him, "It wasn't that big an ouch! You're ok, shake it off!"
28.57%
21.90%
25.71%
0.95%
22.86%

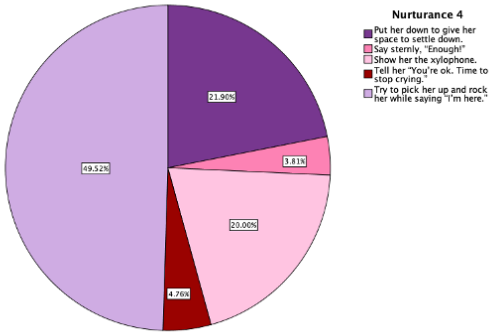
f.


Nurturance 2
Go into the next room and let baby say hi.
Play with another toy in the room or sit quietly and let baby learn to calm down on her own.
Say, "I know you want grandma" and rub her back or pick her up.
Tell your baby, "Be a big girl. There's lots of fun stuff in here!"
Tell your baby, "You're ok. We will see her soon."
4.76%
10.48%
36.19%
1.90%
46.67%

g.


Nurturance 3
Allow her to fuss longer to see if she will settle on her own.
Pick her up out of the chair and rock her.
Shake the rattle near her to see if she likes it.
Tell her, "Oh you're ok, it's not that bad. You just ate!"
0.96%
11.54%
21.15%
66.35%

h.


Nurturance 4
Put her down to give her space to settle down.
Say sternly, "Enough!"
Show her the xylophone.
Tell her "You're ok. Time to stop crying."
Try to pick her up and rock her while saying "I'm here."
21.90%
3.81%
49.52%
20.00%
4.76%

Chapter 5

DISCUSSION

The current study aimed to develop and evaluate a brief measure of sensitivity and nurturance, referred to earlier as sensitive parenting. Though sensitive parenting is extensively studied (Bakermans-Kranenburg et al., 2003; Bernard et al., 2013; Bernier et al., 2010; Bretherton, 2013; Dozier & Bernard, 2019; Hane & Fox, 2006; Hoffman et al., 2006; Juffer et al., 2005; McElwain & Booth-LaForce, 2006; Mesman & Emmen, 2013; Pianta et al., 1989; Posada et al., 2002) and is often an important target or mechanism of early parenting interventions (Cicchetti et al., 1999; Dozier & Bernard, 2019; Hoffman et al., 2006; Juffer et al., 2005), it is typically assessed using observational data that require great amounts of time to both collect and quantify (Mesman & Emmen, 2013). Consequently, there exists a need for a brief, efficient, and psychometrically sound assessment of sensitive parenting in both the research and intervention realms. We developed the VVSPA-I with the intention of bridging this gap.

We predicted that the VVSPA-I would demonstrate good fit using a two-factor solution CFA. This hypothesis was based on literature that suggests that sensitivity and nurturance, the two hypothesized factors, are indeed separate constructs (Bernard et al., 2013; Leerkes et al., 2012). Analysis of the measure's factor structure found support for a two-factor solution according to the commonly used fit indices, however,

the factor loadings of several items were either too low or too high. Taken together, this demonstrated that the VVSPA-I is a promising assessment of sensitive parenting, but that the individual items still require revision. Evaluation of its internal consistency showed that the VVSPA-I is not reliable in its current state, further supporting the need for revision of individual items. Indeed, examination of responses to each item showed vastly different response patterns across different items. For example, 83 participants (79%) chose the correct response on the fourth item in the sensitivity subscale, whereas only 13 (12.4%) chose the "teachy" response, and 5 or fewer (4.8% or less) chose the other teachy, parent-led, or detached responses. In contrast, 51 participants (48.5%) chose the correct responses on the second item in the sensitivity subscale, 24 (22.9%) chose the teachy response, 21 (20%) chose the parent-led response, and 9 (8.6%) chose the detached response. These response patterns indicate that some items are perhaps too easy, while others may be appropriately difficult.

Correlations between the VVSPA-I subscale scores and observed parenting behaviors demonstrated good construct validity for the sensitivity subscale, but not for the nurturance subscale. Specifically, sensitivity subscale scores correlated positively with observed sensitivity and negatively with observed intrusiveness at the 12-month follow-up free-play assessment. Nurturance subscale scores did not correlate with observed nurturance at the prenatal laboratory visit. Though contrary to our predictions, these findings make sense. Nurturance in response to infant distress is particularly difficult to elicit in the laboratory because not all infants become equally

distressed in the same situations (Bernard et al., 2013). The infant simulator task used in the prenatal laboratory visit attempted to elicit nurturance through artificial infant distress. This task has been validated (Voorthuis et al., 2013), but has not been used widely, and so the lack of association between observed nurturance and the nurturance subscale scores must be interpreted with caution.

Given the prominent role of sensitive parenting during infancy and early childhood and its widespread use in research and intervention, the findings from this study have important implications. Though the VVSPA-I did not emerge as completely psychometrically sound, the current study provided "proof of concept" for a brief, efficient measure assessing sensitivity and nurturance using video vignettes. With revision and subsequent re-evaluation, this measure may be of use to other researchers and intervention evaluators who would like to efficiently measure sensitive parenting. In addition, this measure may be of use in primary care or obstetrics settings as a tool to identify parents of infants who could benefit from brief interventions meant to promote sensitive parenting, such as the ABC intervention.

5.1 Strengths and Limitations

Strengths of this study include a relatively diverse sample and multiple measurements of sensitivity and nurturance. In addition, the novelty of the VVSPA-I and its potential in bridging an important gap for both researchers and clinician represents a unique strength. To our knowledge, only one group of researchers in the

field has attempted to develop a non-observational measure of sensitive parenting (Leerkes & Qu, 2017).

Findings from this study should be interpreted in the context of several limitations. First, participants completed the VVSPA-I in the third trimester of pregnancy/up to one-month postpartum or when their infants were around 12 months old but not at any other point in infancy. The aim of the current study was to develop a measure appropriate for parents of infants of all ages (approximately 0-12 months). Future research should evaluate this measure at multiple timepoints across infancy. In addition, the measurement of observed nurturance at the prenatal timepoint represents a limitation of this study. While the infant simulator task is valid (Voorthuis et al., 2013), our coding may not have been highly reliable. Our observed nurturance coding scored an ICC of .53, indicating moderate reliability, but bordering on poor reliability (Koo & Li, 2016). Recoding observed nurturance on the infant simulator task or using a more commonly used nurturance assessment, such as responses to infant distress during the Still-Face Paradigm, may be beneficial in the future.

5.2 Future Directions

Several important revisions must be made to the VVSPA-I prior to re-evaluating its psychometric properties. First, decreasing the number of response options for each item from five to four may be beneficial. Certain response options were only chosen by less than 5% of participants and are likely not representative of parenting behavior in our sample or are behaviors that participants do not feel comfortable

acknowledging. Next, we plan to reword certain response options so that they fit clearly into one of four categories. When first developing the vignettes and response options, we attempted to fit each response option into a category based on common types of parental responses, however, upon further reflection it appears that not every response option clearly fit into a category. Decreasing the number of response options and revising the wording of certain options may improve the variability of responses across items.

We hope that this measure will benefit other researchers, clinicians, and additional professionals who care for infants and their parents. In order to make the VVSPA-I more accessible to such groups, it may be useful to develop and test a version that uses written vignettes, rather than video vignettes. Future research should evaluate a written version of the VVSPA-I for ease of distribution to others in related fields.

Sensitive parenting, involving sensitivity and nurturance, is crucial to infant development and may even buffer against the effects of early adversity on children (Farrell et al., 2017; Lind et al., 2021; Miller et al., 2011). Sensitive parenting may be impacted by various stressors such as parenting stress (Pereira et al., 2012; Smith & Stephens, 2018), sociodemographic risk (Rochette & Bernier, 2014; Tarabulsy et al., 2005), depression or other mental illness (see Bernard et al., 2018 for a review), and may be improved by brief parenting interventions (Cicchetti et al., 1999; Dozier & Bernard, 2019; Hoffman et al., 2006; Juffer et al., 2005). Therefore, it is important to have the ability to efficiently evaluate sensitive parenting across various contexts. The

current study provides preliminary support for such a tool, as well as next steps for further perfecting the VVSPA-I.

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Appendix A

VSSPA-I RESPONSE OPTIONS

Video 1
1. Tell him, "It wasn't that big an ouch! You're ok, shake it off!"
2. Sit back and give him space, since he's looking away.
3. Offer him a snack or an exciting toy to see if that calms him down.
4. Stay close by and say, "Oh honey, that hurt, didn't it?"
5. Tell him to stop crying and fussing.

Video 2
1. Check my phone since the baby is playing on his own.
2. Say, "Why'd you go over there? Come back and play, silly!"
3. Go over to the baby and give him another toy to play with.
4. Say, "Come back here, I told you to come back."
5. Go over to the baby and join in with his play on the other side of the room.

Video 5
1. Take egg and put it in the box to show baby how to play with it
2. Roll the ball again since she had been doing that so nicely with you.
3. Say, "Ah! You have an egg!"
4. Say, "It's an egg! We eat eggs for dinner."
5. Sit back and see if she will learn to play with any of the toys on her own.

Video 6
1. Take baby's book and read it to her.
2. Say, "That's a ladybug. It's red!"
3. Watch the baby look at the book.
4. Say, "You're crinkling the pages! Wow!"
5. Show the baby how to stack the toy cups.

Video 3
1. Go into the next room and let baby say hi.
2. Tell your baby, “You’re ok. We will see her soon.”
3. Say, “I know you want grandma” and rub her back or pick her up.
4. Play with another toy in the room or sit quietly and let baby learn to calm down on her own.
5. Tell your baby, “Be a big girl. There’s lots of fun stuff in here!”

Video 4
1. Tell her, “Oh you’re ok, it’s not that bad. You just ate!”
2. Allow her to fuss longer to see if she will settle on her own.
3. Shake the rattle near her to see if she likes it.
4. Pick her up out of the chair and rock her.
5. Tell her to stop fussing.

Video 7
1. Try to pick her up and rock her while saying “I’m here.”
2. Put her down to give her space to settle down.
3. Show her the xylophone.
4. Tell her “You’re ok. Time to stop crying.”
5. Say sternly, “Enough!”

Video 8
1. Take baby’s rattle and show him how to shake it slowly.
2. Laugh and say, “Shake, shake, shake!”
3. Watch the baby play with the rattle.
4. Say, “What color is your rattle? Orange!”
5. Start reading the toy book to the baby.

Note: **Bold** indicates correct response

Appendix B

IRB/HUMAN SUBJECTS APPROVAL

Institutional Review Board
210H Hullihen Hall
Newark, DE 19716
Phone: 302-831-2137
Fax: 302-831-2828

DATE:	April 16, 2021
TO:	Mary Dozier
FROM:	University of Delaware IRB
STUDY TITLE:	[1210850-33] Modified ABC for Mothers and their Infants
SUBMISSION TYPE:	Continuing Review/Progress Report
ACTION:	APPROVED
APPROVAL DATE:	April 16, 2021
EXPIRATION DATE:	April 16, 2022
REVIEW TYPE:	Expedited Review
REVIEW CATEGORY:	Expedited review category # *(9)*

Thank you for your Continuing Review/Progress Report submission to the University of Delaware Institutional Review Board (UD IRB). The UD IRB has reviewed and APPROVED the proposed research and submitted documents via Expedited Review in compliance with the pertinent federal regulations.

As the Principal Investigator for this study, you are responsible for and agree that:

- All research must be conducted in accordance with the protocol and all other study forms as approved in this submission. Any revisions to the approved study procedures or documents must be reviewed and approved by the IRB prior to their implementation. Please use the UD amendment form to request the review of any changes to approved study procedures or documents.
- Informed consent is a process that must allow prospective participants sufficient opportunity to discuss and consider whether to participate. IRB-approved and stamped consent documents must be used when enrolling participants and a written copy shall be given to the person signing the informed consent form.
- Unanticipated problems, serious adverse events involving risk to participants, and all non-compliance issues must be reported to this office in a timely fashion according with the UD requirements for reportable events. All sponsor reporting requirements must also be followed.

Oversight of this study by the UD IRB REQUIRES the submission of a CONTINUING REVIEW seeking the renewal of this IRB approval, which will expire on April 16, 2022. A continuing review/progress report form and up-to-date copies of the protocol form and all other approved study materials must be submitted to the UD IRB at least 45 days prior to the expiration date to allow for the required IRB review of that report.

If you have any questions, please contact the UD IRB Office at (302) 831-2137 or via email at hsrb-research@udel.edu. Please include the study title and reference number in all correspondence with this office.

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Institutional Review Board
210H Hullihen Hall
Newark, DE 19716
Phone: 302-831-2137
Fax: 302-831-2828

DATE:	April 8, 2021
TO:	Mary Dozier
FROM:	University of Delaware IRB
STUDY TITLE:	[1576412-9] Intervening with Opioid-Dependent Mothers Living in Poverty: Effects on Mothers' and Infants' Behavioral and Biological Regulation
SUBMISSION TYPE:	Continuing Review/Progress Report
ACTION:	APPROVED
APPROVAL DATE:	April 8, 2021
EXPIRATION DATE:	April 14, 2022
REVIEW TYPE:	Expedited Review
REVIEW CATEGORY:	Expedited review category # *(9)Minimal Risk Research with Children-Subpart D Determination- 45 CFR 46.404*

Thank you for your Continuing Review/Progress Report submission to the University of Delaware Institutional Review Board (UD IRB). The UD IRB has reviewed and APPROVED the proposed research and submitted documents via Expedited Review in compliance with the pertinent federal regulations.

As the Principal Investigator for this study, you are responsible for and agree that:

- All research must be conducted in accordance with the protocol and all other study forms as approved in this submission. Any revisions to the approved study procedures or documents must be reviewed and approved by the IRB prior to their implementation. Please use the UD amendment form to request the review of any changes to approved study procedures or documents.
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