

DISSERTATION

VALIDATION OF THE EMOTIONAL AVAILABILITY SELF-REPORT FOR USE WITH  
CHILDREN 0-5 YEARS

Submitted by

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## ABSTRACT

### VALIDATION OF THE EMOTIONAL AVAILABILITY SELF-REPORT FOR USE WITH CHILDREN 0-5 YEARS

Emotional availability (EA) is a relationship construct that is used to assess the health and quality of the relationship between a caregiver and their child by examining the contribution of each member of the relationship. Empirical research has found a great deal of evidence that EA is an important factor to consider in parent-child relationship research and is linked with various parental and child outcomes, such as mental health issues, and various child development issues, such as depression and personality disorders in mothers and children's development of theory of mind. Most of the extant research measures EA using an observational EA System (Biringen et al., 2014). However, in 2002, an Emotional-Availability - Self-Report (EA-SR) instrument was introduced to assess parental perceptions of EA in their relationship with their child (Biringen et al., 2002). Evidence for the validity of EA-SR scores has been established for use with children 0-18 months, but has yet to be investigated with older children. This study aimed to establish the reliability and validity of scores on the EA-SR for use with children 0-5 years of age. Data analysis included an Exploratory Factor Analysis (EFA) and a Confirmatory Factor Analysis (CFA) to determine the factor structure of the EA-SR, as well as an examination of convergent and discriminant correlations between EA-SR scores and those on other measures. Initial evidence was found that a 13-item short form of the EA-SR may be a valid and reliable measure of EA for children ages 3-5.

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## INTRODUCTION

Attachment theory posits that an infant becomes either securely or insecurely attached to their caregiver via a process of social bonding and the development of affectional ties. Most research on attachment theory has involved the “strange situation,” pioneered by Mary Ainsworth, which places the caregiver and infant in a laboratory situation which involves the infant meeting a strange adult in an unfamiliar room, and the departure and reentry of the parent figure. The reactions of the infant are observed. A “securely” attached infant typically seeks to be close to their caregiver and is upset when they leave, but also shows interest in exploring their environment. As assessed in the strange situation, “insecure” attachment is characterized by avoidant or angry behavior or by angry/resistant/anxious behavior in reaction to the parent (Ainsworth et al., 1978). Attachment security has been linked to various long-term outcomes both in children and in adults. For example, early secure attachment in children has been linked with better socio-emotional development, better mental health outcomes, and better brain development and therefore, higher academic achievement, cognitive abilities, and language development than insecure attachment (Ainsworth, 1985; Ranson & Urichuk, 2008). Secure attachment has also been linked to better mental health, more pro-social values, and increased inter-group tolerance in adults (Mikulincer & Shaver, 2007).

Emotional availability (EA) has been conceptualized as the means to a secure attachment. EA is a relationship (dyadic) construct that refers not only to the behaviors and affect of both the caregiver and the child, but also the emotional connection or emotional health of the mother-child relationship (Biringen & Robinson, 1991; Biringen et al., 2014). EA has been linked to the security of infant attachments as well as adult representations of attachment

(Biringen, 2000). One particularly important aspect of EA is parental sensitivity to the child's communicated needs and the ability to appropriately respond to and fulfill those needs. This idea was originally formulated in the context of attachment theory and research (Bretherton, 2000). While EA includes sensitivity as an important dimension within the larger EA framework, affect or emotion is at the heart of the sensitivity construct for EA, but not in traditional attachment theory (Biringen, 2000).

The conceptualization of observational EA includes multiple caregiver and child dimensions. The caregiver components are sensitivity, structuring, non-intrusiveness, and non-hostility. The child components are child-responsiveness to the caregiver, and child's involvement of the caregiver. It is understood that both caregiver and the child dimensions are vital to understanding EA within the relationship, meaning that one cannot be measured without the other (Biringen et al., 2014; Biringen et al. 2021). Most emotional availability research have used the observational EA Scales to measure relationship quality. The observational EA Scales have been validated for use with children between the ages of zero and 14 years. The scales use an observational 7-point scoring system to code parent/child interactions (Biringen, 2000; Biringen et al., 2014).

### **Emotional Availability Components in EA Observational Scales**

The observational EA System includes the four caregiver components and two child components.

#### ***Caregiver Sensitivity***

Sensitivity is the dimension of EA that is most closely linked to attachment theory (Ainsworth et al., 1978). In EA, there is a broader view of the concept by focusing on not just behavioral sensitivity, but emotional sensitivity as well. The most crucial aspect of this concept

is how well parents/caregivers communicate appropriate emotion in response to their children and how well they pick up on (how sensitive they are to) the emotional signals that their children give (Biringen, 2000; Biringen et al., 2014). Furthermore, a caregiver who is considered sensitive would generally exhibit sincere and primarily positive affect. Verbal emotional expression also would be congruent with nonverbal cues. The dyadic nature of EA sensitivity suggests that a highly sensitive parent would be raising a child who is high on emotional responsiveness and involvement, given there is a mutually reinforcing and positive feedback loop in such interactions (Biringen et al. 2014).

### ***Caregiver Structuring***

Structuring refers to the caregiver's ability to provide a framework for the child's activities. This includes setting appropriate limits and rules, as well as providing guidance and mentorship to the child, while also allowing the child to have some autonomy and say in the relationship. A caregiver who provides good structuring also encourages desirable adaptive behaviors, while discouraging maladaptive behaviors. Structuring is successful if the child appears to pay attention to and responds appropriately to the caregiver's interventions (Biringen, 2000; Biringen et al., 2014).

### ***Caregiver Non-intrusiveness***

Non-intrusiveness contrasts with structuring in that it refers to the caregiver's ability to not infringe on the child's autonomy. In other words, the caregiver is available when needed while not being overbearing or overprotective. The behaviors that might lead to a caregiver being considered intrusive depend on the child's stage of development as well as the child's ability to provide the caregiver with feedback. For example, helping a child eat their food may be considered appropriate for a younger child, but may be considered intrusive at an older age

(Biringen, 2000; Biringen et al., 2014). While the dyadic nature of EA also applies here (as with all EA dimensions), one cannot fully rely on the child's reactions to decide if a caregiver is being intrusive. For example, if a caregiver is sufficiently overbearing, a child may adopt a passive style and be agreeable to whatever the caregiver is doing. The observer nonetheless would judge such a relationship as intrusive, based on the adult's style.

### ***Caregiver Non-hostility***

Non-hostility refers to the caregiver's ability to provide the child with an environment and interactions that are free of signs of hostility, including any background hostility (i.e. not directed at the child) (Biringen, 2000; Biringen et al., 2014). Being non-hostile means expressing negative emotions in a calm, rational, and emotionally regulated manner. For older children, an important aspect of non-hostility is the caregiver's ability to explain their emotions and reactions to the child as opposed to being reactive (Biringen, 2000).

### ***Child Responsiveness***

The dimension of child responsiveness to the caregiver is closely aligned with the child's attachment security, at both a conceptual and empirical level (Bretherton, 2000), except that the child's emotional responsiveness is not assessed only under separation or other distress contexts, but also during play and real-world interactions. Within EA, an appropriately responsive child exhibits a good balance of autonomy and an ability to be emotionally responsive to the parent. At younger ages, being emotionally responsive is typically expressed as being happy during interactions with the parent. Older children may exhibit more reciprocal and joint behavior that fosters connection with the parent, like reacting to an experience or memory with the parent. Children with high EA typically have positive narratives of parental figures and show signs of positive emotional connection with the caregiver, without being overly attached (Biringen,

2000). This scale also measures the extent of avoidance or clinginess as part of the child responsiveness scale (Biringen et al., 2014).

### ***Child Involvement of the Caregiver***

Child involvement of the caregiver refers to the child's ability to appropriately involve their parent in their activities and interactions. Ideally, the child's involvement of the parent is at the median and not under or over involving. A securely attached child has a balance between independent activities and those that involve the parent (Biringen, 2000). A child who is optimally involving of the parent will seek out interaction with the parent and will try to involve the parent in their play/activities by seeking guidance, making eye contact, showing objects to the parent, and explaining activities in a way that is positive and comfortable, without being too demanding or exhibiting negative initiation behavior (e.g., crying or distress; Biringen, 2000; Biringen et al., 2014).

### **Research on EA and Parent and Child Outcomes Using the Observational EA Scales**

Emotional availability (EA) has been studied extensively (Biringen et al., 2014), and is empirically linked to many important parental factors and child development outcomes, such as mental health and physical health issues (e.g., Aran et al., 2021; Bergmann et al., 2015; Flykt et al. 2021). This section will review studies that have examined these factors and their relationship with EA. Most research has centered primarily on mothers and infants/younger children (zero months to three years), with some studies including fathers and/or older children. The literature review will focus specifically on EA, and not on other similar constructs.

### ***EA and Mental Health Outcomes***

**Mood Disorders.** Previous studies have found that the presence of mood disorders (e.g., depression, bipolar) in mothers during the first few months of their children's lives may impact

the formation of their relationship with their children as evidenced by lower EA (Aran et al., 2021; Kim & Teti, 2014). For instance, one study found that mothers' depressive symptoms in the first few months of the infant's life (one to six months) was predictive of lower EA dimensions later in the first year (nine months), if they perceived their infant to be more reactive and higher in negative affect. The findings were less conclusive for mothers who did not perceive that about their infant (Kim & Teti, 2014). This finding in particular highlights the importance of the child's contributions within the dyad, and suggests that there is a relationship between mothers' depression and EA. Additionally, severity of mental health symptoms in mothers prior to childbirth and early during the child's life can impact how much mental health diagnoses affect mother-infant EA. A study of mother-infant dyads in Australia found that the risk for lower EA was higher among women who were diagnosed with bipolar disorder (BD), compared to those with major depressive disorder (MDD). This may be because of the more complex nature of BD, and therefore result in a more severe impact on the relationship quality of the mother-infant dyad (Aran et al., 2021).

**Personality Disorders.** Emotional availability has also been associated with the development of personality disorders. A study of mothers with and without borderline personality disorder (BPD) and their children between the ages of four and seven years found that children from dyads that had lower EA had more risk factors associated with developing BPD, such as physical abuse, neglect, and negative narratives about the mother-child relationship. Older girls were also more at risk for engaging in role reversal with their mothers. The findings suggest that interventions aimed at increasing emotional availability may counteract the development of psychopathology (Trupe et al., 2017).

**Stress.** There is evidence to suggest that stress can have an influence on EA (Azhari et al., 2020; Dittrich et al., 2017). One study assessed the interactions between mothers and fathers and their 3- to 4-year-old children. The researchers concluded that parental stress that results from having a difficult child can impact the quality of EA, specifically parental non-hostility. This dynamic is also influenced by past parent experiences with their own parents, suggesting that stress and past family of origin experiences interact to impact EA (Azhari et al., 2020). The second study assessed mothers' interactions with their 5- to 12-year-old children. The results indicated that the amount of stress that the mother and child experience during an activity influences EA. The findings indicated that during tasks versus free play, mothers tended to exhibit greater sensitivity, structuring, and non-hostility, but less non-intrusiveness, while children showed higher responsiveness. However, when environmental stress was controlled for, the relationship between EA and the context decreased substantially (Dittrich et al., 2017). Together, these studies suggest that stress is an important contextual and environmental factor that should be considered when measuring EA.

**Substance Use.** Emotional availability has also been studied in the context of parental substance use. For example, in one study of substance abusing mothers and their infants, the presence of substance overuse contributed to less parental sensitivity, less structuring, more intrusiveness, and more hostility. On the child's side it contributed to decreased responsiveness and less involvement of the mother (Isosavi et al., 2016). This is problematic, since evidence suggests that EA mediates the relationship between substance use and child development outcomes. For example, lower EA within the dyad contributes to increased emotional dysregulation in infants and worse development of emotional regulation (ER) strategies in middle childhood (Punamäki et al., 2021) while higher mother-child EA leads to better

emotional recognition and mentalization (the ability to recognize how underlying mental states impact one's and others' actions) in school age children (Flykt et al. 2021).

### ***EA and Infant Sleep***

Emotional availability has also been examined in the context of infant sleep. The findings have been variable, with there being some evidence that mothers' and infants' sleep quality across the first six months was predictive of better maternal EA at bedtime at nine months, and increased sleep quality for the infant. However, some evidence suggests that the association is not so simple, and that other factors such as infant temperament and maternal resources can influence that emotional connection (Jian & Teti, 2016; Kim & Teti, 2014). For example, one study found that parental sleep quality in earlier months was not predictive of EA in later months, suggesting that there may be other factors at play (Kim & Teti, 2014).

### ***EA and Socioeconomic Status***

Socioeconomic factors, specifically poverty status, can impact EA. The evidence to support this comes from studies that have focused on low-income mothers and their children. Low socioeconomic status appears to predispose mothers to being more vulnerable to misreading or misunderstanding their child's cues, resulting in poorer EA (Kim et al., 2017; Negrao et al., 2016). For example, low-income mothers were found to exhibit more intrusiveness in their interactions with their infants (zero to six months; Kim et al., 2017). In a study of older children (ages one to four years), economically disadvantaged mothers were shown to be lower in EA during free play. Their economic status was associated with increased mental preoccupation, which contributed to the lower EA (Negrao et al., 2016). These findings suggest that EA should be considered within the context of socioeconomic and sociocultural factors.

### ***EA and Relational Context***

The caregiver and child relationship does not exist in a vacuum, and can therefore be influenced by various outside factors, including other relationships that the caregiver and child engage in. Mingo and Easterbrooks (2015) highlighted the importance of examining the quality of mother-child relationship from a systemic and relationship perspective, since living arrangements and mother's approach to conflict resolution with the child and their partner was shown to impact EA (specifically maternal sensitivity and non-hostility, and child responsiveness) within the mother-child relationship. There is also evidence that marital satisfaction and co-parenting satisfaction can lead to better EA for both mothers and fathers (Kim & Teti, 2013; Kim et al., 2021; Salo et al., 2019). While there appear to be some differences between mothers and fathers in the directness of the impact on EA, relationship satisfaction was found to predict parental EA and infant problem behaviors and social development (Salo et al., 2019). As expected, higher EA was associated with less behavioral and developmental problems. The findings confirm that the relationship between the caregiver and the child, is impacted by the relationships between the parents, as well as other contextual factors, such as living environment and socioeconomic status.

### ***Other EA Research***

**Mental States.** Research on EA has included some additional factors, including parent-specific factors, child development outcomes, and certain health problems. For example, a study of mothers and children between the ages of three and 10 years examined the connection between mothers' mentalization and EA. Mentalization refers to an individual's ability to recognize and think about mental states in themselves and others, and then use that information

to draw conclusions from human behavior. The findings suggest that a mother's ability to mentalize can have an impact on EA (Möller et al., 2017).

Another study found that there are some differences in EA depending on the age of the mother. Crugnola et al. (2018) compared EA in adolescent mothers and adult mothers in interactions with their infants at three months. Adolescent mothers tended to exhibit less capacity to reflect on their relationships and themselves in terms of mental states, such as feelings, thoughts, and beliefs. They also displayed less sensitivity, less structuring, and more intrusiveness and hostility. On the other hand, adult mothers who had higher reflective functioning tended to be more sensitive and exhibit better EA.

Mothers' ability to use mental state language with their children has also been linked with EA and the child's development of theory of mind. A longitudinal study that assessed children at seven, 24, and 50 months revealed that there is a link between those factors, with some variability depending on the age of the child. The study also found support for the continuity of EA through different stages of the child's development, since there was a link between earlier and later EA (Kristen-Antonow et al., 2018). Together these studies provide further evidence that EA is an important contributing factor to child development and may be a target of interventions that aim to improve the quality of caregiver-child relationships.

**Obesity.** Finally, there is empirical evidence that links EA with maternal obesity, in conjunction with difficulty in recognizing emotions. A study of mothers and their interactions with their children between the ages of six and 47 months, demonstrated a relation between maternal obesity and relationship quality, but noted that only obese mothers who had a lower capacity to recognize and understand emotions showed lower EA, whereas those obese mothers

who did not present with this challenge interacted well with their children (Bergmann et al., 2015).

### **Emotional Availability – Self-Report (EA-SR)**

The EA-SR was created based on the observational EA Scales and designed to assess parental perceptions of emotional availability within their relationship with their child (See Appendix B). The most obvious difference between the EA-SR and the observational EA Scales is that the EA-SR is based on the parents' perceptions of their interactions with their children as opposed ratings supplied by an outside observer. The self-report measure contains 36 items on which parents rate their perceptions of their own and their child's emotional availability on a 5-point Likert-type scale from 1 (*Do not agree at all*) to 5 (*Totally agree*). Due to the more readily accessible nature of self-report measures over observational assessments, the EA-SR has recently gained more attention and use in studies that want to examine this construct (e.g., Punamäki et al., 2017; Punamäki et al., 2019; Qouta et al., 2021). However, evidence of validity has yet to be established in the United States for its use with mothers and children older than 18 months.

### **Psychometric Properties of the EA-SR**

Several studies have assessed the psychometric properties of the EA-SR (Punamäki et al., 2017; Punamäki et al., 2019; Qouta et al., 2021; Vliegen et al., 2005). These studies sampled infants and young children (0 to 18 months), with no studies investigating its use with older children. It is important to be able to measure EA for older children as well, because EA is relevant for the child-parent relationship and can impact outcomes at all ages, not just in infancy and toddlerhood (e.g., Azhari et al., 2020; Dittrich et al., 2017; Möller et al., 2017; Trupe et al., 2017). Also, there has been recent interest in using the EA-SR with older children and adolescents (e.g., Brown, Rodriguez, Harman, and Biringen are currently using the EA-SR to

collect data on parents with children ages 0-to-17 years). There has also been some discrepancy in how the measure has been used across the literature (e.g., using different numbers of items), creating a need for standardization of the measure, to the extent that psychometric support across diverse groups will allow. The following section will review the extant research conducted using the EA-SR measure as well as the prominent limitations within the existing literature.

### ***Scale Development***

The items for the EA-SR were created based on the EA observational scales. The researchers generated 66 items to assess all six subscales defined in the EAS manual (Biringen et al., 1998). These items were then reviewed by seven clinical psychologists/child psychotherapists with at least 15 years of clinical experience, who indicated which of the six dimensions was the best fit for each item. Only those items which had unanimous agreement were retained in the initial pool, resulting in 62 items. The preliminary set of 62 items was administered to a sample of Belgian mothers (N = 244) with children between the ages of zero and 18 months (Vliegen et al., 2005). An exploratory Principal Component Analysis (PCA) with Varimax rotation with Kaiser normalization assessed participants' responses to the 62 items. The results of the PCA suggested a five-factor solution. Based on these results a Confirmatory Factor Analysis (CFA) was conducted to test the fit of three models: (1) Model 1, 36 items (all item loadings of .40 or higher in the PCA) loading onto six factors, (2) Model 2, 32 items (all item loadings of .45 or higher in the PCA) loading onto five factors, and (3) Model 3, 24 items (all item loading of .50 or higher) loading onto four factors. The best fitting model was evaluated based on three indices of goodness of fit; (a) the  $\chi^2$  ( $p < .05$ ), (b) the Root Mean Square Error of Approximation (RMSEA), with values below .05 indicating a good fit, and values below .08 indicating an acceptable fit, and (c) the Comparative Fit Index (CFI), with values higher than .90

indicating a good fit (Du Toit et al., 1999). Also, all items that cross loaded onto a second factor ( $\geq .30$ ) were excluded (Vliegen et al., 2005). The results indicated that Model 2 (32 items loading onto five-factors) demonstrated the best fit to the data. However, due to the small number of items that loaded onto one of the factors, four new items were written and added to the *maternal hostility* subscale, resulting in a final 36-item version of the measure (Vliegen et al., 2005).

Thus, results indicated that the items in the EA-SR reflect five factors: mutual attunement, affect quality, child's capacity to involve the parent, parent intrusiveness, and parent hostility (Vliegen et al., 2005). Those five factors were further organized into three categories, two caregiver subscales, one child subscale, and two dyadic subscales, but still scored as five separate subscales (Vliegen et al., 2005). There also were no significant correlations between most of the subscales of the EA-SR. Other than a moderate correlation between the mutual attunement and affect quality subscales ( $r = .37$ ), all significant correlations were small ( $r < .30$ ) (Vliegen et al., 2005). This provided further support for the validity of these factors as distinct.

**Caregiver Subscales.** The caregiver subscales of the EA-SR refer to the parents' role in the relationship. The subscales include parent intrusiveness and parent hostility. The *parent intrusiveness* subscale measures parental behaviors that are unnecessary and unelicited by the child. It is similar to the *caregiver non-intrusiveness* dimension of the observational EA Scales (Vliegen et al., 2005). Intrusive parents may fail to give the child an appropriate amount of space (Vliegen et al., 2005). The *parent hostility* subscale, as with the *caregiver non-hostility* dimension of the observational EA Scales, refers to parental expression that can be considered overtly and covertly hostile (Vliegen et al., 2005). This can include overt aggressiveness or anger toward the child, or more covert expressions of hostility, such as boredom or teasing. Covert

expressions of hostility are more difficult for mothers to recognize and are therefore more challenging to assess via self-report (Vliegen et al., 2005).

**Child Subscale.** Unlike the EA observational system, the EA-SR may have one rather than two subscales related to the child's emotional availability. Specifically, the *child's capacity to involve the parent* subscale measures the parent's perceptions of how well their child is able to gain their attention and facilitate the parent's participation in their activities. This subscale is similar to the EA Scale of child involvement of parent, but has a more focused scope (Vliegen et al., 2005).

**Dyadic Subscales.** The last two subscales refer to the relational qualities of the interaction, including mutual attunement and affect quality. The *mutual attunement* subscale combines the observational EA Scale dimensions of parental sensitivity and child involvement of the parent. It measures the quality of the interaction between the child and parent in circumstances where the parent responds to a child's attempts to engage them in their play or during a time of need. The *affect quality* subscale is most closely related to the observational EA Scale dimensions of caregiver sensitivity and child responsiveness. Affect quality combines the caregivers' positive displays of affection and acceptance of the child, with the child's positive response to those displays. Because the scale assesses the pair's evaluation of their time together, it is considered a dyadic subscale.

### ***Validity***

The literature suggests that the five-factor structure partially overlaps with the six dimensions of the observational EA Scales, in that each factor encompasses some part of one or more of the original six dimensions (e.g., the *mutual attunement* subscale has aspects of both the *parental sensitivity* and *child involvement* dimensions) (Biringen et al., 1998; Vliegen et al.,

2005). The researchers posited that the discrepancy that does exist may be due to the differences between the observational scales and the self-report, in that the self-report measures the parent's perceptions while the observational scales rely on the observers' ability to assess the contributions of both the parent and the child.

A major contribution to the EA-SR literature that provided evidence of convergent and criterion-related validity was a study that explored how observed EA compared to self-reported EA in depressed ( $n = 49$ ) and nondepressed mothers ( $n = 35$ ; Vliegen et al., 2009). The study was conducted with Belgian mothers of infants about four to six months of age. Depressed mothers overall scored lower on most dimensions of EA, both observed and self-report, with the exception of observed hostility and self-reported intrusiveness and hostility. This supports the criterion-related validity of the subscales as the literature suggests that depressed mothers score lower on EA (Kim & Teti, 2014). With regard to construct validity, scores on the observational EA and the self-reported EA using the two dyadic scales of the EA-SR (*mutual attunement* and *affect quality*) were positively correlated with scores on all six dimensions of the observational EA Scales, suggesting that those scales assess aspects of the same basic construct, i.e., the overall quality of the relationship. Furthermore, scores on perceived *child involvement* were correlated with observed *child responsiveness*, *child involvement*, and *caregiver sensitivity*. Perceived *parent hostility* was correlated with observed *caregiver nonhostility* and *caregiver nonintrusiveness*. Interestingly, *parent intrusiveness* as reported by the mother was not significantly correlated with *caregiver nonintrusiveness* or any of the other observational EA Scales. (Vliegen et al., 2009). This study contributed in an important way to understanding how the EA-SR connects to the observational EA Scales. However, the sample was relatively small

and the age of children was limited, with ages generally between four to six months, meaning that it did not provide any information about the use of the EA-SR for any ages above one.

The same group of researchers conducted another study that used the EA-SR. This study (Vliegen et al., 2013) examined the rational and treatment principles of a hospital-based treatment for 41 Belgian mothers who were hospitalized in a mother-infant unit due to postpartum depression. In terms of self-reported EA, improvements were seen in the *affect quality* and the *child's capacity to involve the mother*. No changes were reported on the other dimensions of *mutual attunement*, *intrusiveness*, or *hostility*. In support of criterion-related and construct validity, this suggests that at least some of the EA-SR subscales (i.e., *affect quality* and the *child's capacity to involve the mother*) may be related to depression outcomes, but others may not (*mutual attunement*, *intrusiveness*, and *hostility*). This is similar to the findings of Vliegen et al. (2009), except for the findings that *mutual attunement* was not related to depression in this study. The researchers reported that each mother filled out a 32-item version of the EA-SR at follow-up (32 to 57 months later). This is inconsistent with the initial study which used the full 36-items. It is unclear why four items were excluded, nor which items they were (Vliegen et al., 2013).

Additional validity evidence for the EA-SR came from a series of studies that examined the impact that mothers' exposure to traumatic war events had on their emotional availability (children were 0-18 months of age). All three studies drew from a sample that came from a larger study of Palestinian mothers. Evidence from these studies suggests that for Palestinian mothers (N = 502), exposure to the horrors of war while they were pregnant contributed greatly to and predicted the development of PTSD, which was also associated with lower self-reported EA at later dates (Punamäki et al., 2017; Punamäki et al., 2019; Qouta et al., 2021).

All three of these studies used a brief 28-item version of the EA-SR. However, it is unclear which items were taken out or why. The studies conducted a CFA to detect three dimensions (*close and positive dyadic relationships*, *distant and hard-to-soothe dyadic relationships*, and *emotional scaffolding*). However, it is unclear how these dimensions relate to the original 36-item version of the EA-SR. Qouta et al. (2021) stated that they found that the three dimensions of the short version of the EA-SR correlate moderately and positively with the observational EA Scales (e.g., correlations ranging from 0.37 to 0.44 between *close and positive dyadic relationships* and the six observational dimensions).

### **Reliability**

Among Belgian mothers (N = 244) with children between the ages of zero and 18 months, the five-factor structure of the measure was shown to produce scores with adequate internal consistency on four of the five subscales ( $.71 \leq \alpha \leq .84$ ), but a lower internal consistency coefficient for the *affect quality* subscale ( $\alpha = .49$ ). The researchers proposed that this may be due to the smaller number of items on that subscale paired with more diverse content that the items address (Vliegen et al., 2005). No other studies have examined the reliability of the five-factor solution of the EA-SR; therefore it was important to assess this, especially to examine whether the *affect quality* subscale again demonstrated low internal consistency.

In the sample of Palestinian mothers (N = 502), the reliability was variable across the three proposed dimensions with *close and positive* having acceptable internal consistency ( $\alpha = 0.71$ ), *distant and hard to soothe* having below-threshold internal consistency ( $\alpha = 0.65$ ), and *emotional scaffolding* having poor internal consistency ( $\alpha = 0.51$ ; Qouta et al., 2021).

## **Summary**

Taken together, research demonstrates the important role of EA within parenting and child development. There is ample evidence from studies that indicate that EA influences and can be influenced by factors that contribute to the emotional, mental, and physical health of both parents and their children. It is, therefore, crucial for there to be valid and reliable measures available to researchers and practitioners that assess EA within caregiver-child relationships. The EA observational scales are a well-established way to assess emotional availability. However, the scales require extensive training to use correctly, and only provide information based on observer coding. The EA-SR was created as a more efficient and accessible tool to measure parental perceptions of the quality of their interactions with their children. However, it had yet to be validated for use with mothers of children over the age of 18 months or using a sample of participants from the United States. There is ample evidence that EA is a relevant and important factor for parent-child relationships across different ages of the child, particularly infancy through preschool ages (zero to five years) (e.g., Azhari et al., 2020; Dittrich et al., 2017; Möller et al., 2017; Trupe et al., 2017). Therefore, it was important for the EA-SR to also be validated for use with ages zero to five, especially because a self-report measure provides an efficient tool for both researchers and practitioners.

## **The Current Study**

The EA-SR is an efficient and accessible tool for assessing the quality of parent/child relationships via the perceptions of the parent. Although the measure has been validated for use with infants and younger children (i.e., 18 months and younger), it has yet to be validated for use with older ages. Given the significance of emotional availability within parent-child dyads across early childhood, it is important to understand the psychometric properties and structure of the

measure across age groups. This will allow researchers to make informed decisions about what measures of emotional availability most are appropriate for their studies, given the demographics of their participants.

Vliegen et al. (2005) proposed that the items in the EA-SR load onto five factors when used with infants: mutual attunement, affect quality, dyad interactions, parent intrusiveness, and parent hostility. This study sought to expand on this study by confirming whether that factor structure is appropriate for other ages, (0-to-5 years), as well as examining other possible structures, such as the three-factor structure proposed by Punamäki and colleagues (2019, 2021) and Qouta and colleagues (2021), or a six-factor structure aligning with the dimensions of the EA observational system. Since part of the purpose of this study was to replicate the method of the Vliegen et al. (2005) study as closely as possible, this study focused only on mothers.

The study also focused on gaining an understanding of how EA for older children compares with other outcomes and measures. It was important to establish both convergent and discriminant validity, which are evidence of construct validity. Such evidence helps evaluate the extent to which the instrument is meeting the claims made for it by the scale developers, using a previously unstudied population of interest in EA-SR research. This can be achieved by showing that scores on the measure correlate positively at relatively strong magnitudes with scores on measures intended to assess conceptually similar constructs, and do not correlate as strongly with scores on measures that assess constructs that are conceptually dissimilar (Clark & Watson, 1991; Cronbach & Meehl, 1955). For consistency, this study measured some of the same variables using some of the same scales that Vliegen et al. (2005) used to establish convergent and discriminant validity.

In summary, the goals of the study were to: (a) expand the use of the EA-SR for a slightly broader age range (currently validated for 0-to-18 months); (b) conduct EFA to determine factor structure of the EA-SR and CFAs to determine if the EA-SR fits the five factors proposed by Vliegen et al. (2005; *mutual attunement*, *affect quality*, *child ability to involve parent*, *parent intrusiveness*, and *parent hostility*) for children ages 0-to-5 years; (c) compare the five-factor structure to other theoretically plausible factor structures for the EA-SR, including but not limited to a single factor structure; (d) establish initial convergent and discriminant validity for scores on each unique subscale by examining bivariate and unique relationships between the EA-SR and other relevant measures, and (e) examine measurement invariance across ages 0-to-17 months, 18 months-to-2 years, and 3-to-5 years using multigroup confirmatory factor analysis to see if cross-group comparisons are valid.

Based on previous findings for younger ages it was hypothesized that the EA-SR items will load onto the same five factors proposed by Vliegen et al. (2005) for ages 0-to-5. Furthermore, since there is empirical evidence that there is a relationship between parent depression, anxiety, and emotional availability and specifically some of the subscales of the EA-SR, it is hypothesized that (a) there will be a significant negative relationship between scores on subscales of *affect quality* and the *child's capacity to involve the mother* with depression; (b) there will be no significant relationship between scores on the other three subscales (*mutual attunement*, *intrusiveness*, *hostility*) and depression; and (c) there will significant, moderate-to-strong negative relationships between scores on the measure of anxiety and scores on *affect quality*, *child's capacity to involve the mother*, and *mutual attunement*, the relationship will be positive with scores on *intrusiveness* and *hostility*. Since there is a connection between emotional availability and child's social and emotional development, there will likely be a

significant, moderate-to-strong relationship between measures of emotional and behavioral development concerns (i.e., externalizing, internalizing, attention problems, and parenting challenges) and the scores on the subscales of the EA-SR (likely negative relationships with *affect quality*, *child's capacity to involve the mother*, and *mutual attunement* and positive with *intrusiveness* and *hostility*). Also, since evidence suggests that family factors and relationships can greatly impact emotional availability, it is hypothesized that EA-SR subscale scores will have a moderate-to-strong relationship with scores on scales that measure concerning aspects of the family context such as substance use or other psychosocial risk factors (likely negative relationships with *affect quality*, *child's capacity to involve the mother*, and *mutual attunement* and positive with *intrusiveness* and *hostility*). Since the EA-SR is not meant to measure personality traits, it is likely that there will be a small relationship or no relationship between scores on the EA-SR subscales and scores on measures of personality dimensions.

## METHOD

### Participants

Participants were recruited via Amazon Mechanical Turk (MTurk), an online platform run by Amazon that researchers can use to recruit human subjects for their studies. The participants were asked to provide demographic information regarding themselves and their child as well as complete a self-report questionnaire that included the EA-SR along with measures of depression, anxiety, personality, and child well-being. The recruitment criteria specified that participants had to be a mother, 18 years or older, and have at least one child between the ages of zero and five. Only mothers were included in this study, since the goal was to stay as consistent as possible with other EA-SR validation studies which focused only on mothers (i.e., Vliegen et al., 2005). A total of 811 people completed the survey. However, only 410 individuals met the participation criteria and passed attention checks and were included in the data analyses.

The demographic information for participants that were included in the data analyses are presented in Table 1.

*Table 1: Parent Demographic Information*

	<i>n</i>	<i>%</i>
Gender		
Cisgender	405	99
Transgender	3	<1
Neither cisgender nor transgender	1	<1
Unsure	2	<1
Ethnicity		
Hispanic origin	49	12
Not of Hispanic origin	349	85
Prefer not to answer	12	3
Race		
American Indian or Alaska Native	14	3
Asian	18	4

Black or African American	0	0
Middle Eastern	0	0
Native Hawaiian or Pacific Islander	0	0
White	369	90
Another race/ethnicity or Multiple races/ethnicities	8	2
Prefer not to answer	1	<1
<b>Sexual Orientation</b>		
Asexual	17	4
Bisexual	115	28
Gay	1	<1
Heterosexual/Straight	263	64
Lesbian	0	0
Pansexual	0	0
Queer	0	0
Questioning	0	0
Selected multiple responses	14	3
<b>Household Income</b>		
Less than \$20,000	13	3
\$20,000 - \$39,999	64	16
\$40,000 - \$59,999	112	27
\$60,000 - \$79,999	120	29
\$80,000 - \$99,999	65	16
More than \$100,000	35	9
Prefer not to answer	1	<1
<b>Relationship Status</b>		
Single, never married	10	2
Married or partner living in the home	397	97
Partner not living in the home	0	0
Separated	0	0
Divorced	1	<1
Widowed	0	0
Prefer not to answer	2	<1
<b>Education</b>		
Less than high school degree	1	<1
High school graduate (high school diploma or equivalent including GED)	15	4
Some college but no degree	4	1
Associate degree in college (2-year)	6	1
Bachelor's degree in college (4-year)	284	69
Master's degree	98	24
Doctoral degree	1	<1
Professional degree	1	<1

The ages of the 410 participants ranged from 19 to 69 years; the mean was 33 years (SD = 9.50). Since this study was for mothers only, only participants who identified as female were included in this study. Most participants identified as cisgender (99 percent) and binary (97 percent) with less than one percent identifying as transgender, and several selecting neither transgender nor cisgender or unsure. Only three percent of participants identified as nonbinary, and one participant selected neither binary nor nonbinary. Data on which country participants live in was only available for 262 out of the 410 participants. Of those, 99 percent indicated that they live in the U.S., two participants indicated that they live in India, and one participant in Canada. In terms of ethnicity, 12 percent of participants indicated that they were of Hispanic origin, three percent selected “prefer not to answer,” and the rest selected not of Hispanic origin. A total of 90 percent of participants identified as White, four percent as Asian, three percent as American Indian or Alaska Native, and one percent as multiple races/ethnicities. The distribution of sexual orientation of participants was 64 percent heterosexual/straight, 28 percent bisexual, four percent asexual, three percent multiple sexual orientations, and less than one percent identified as gay. Household incomes of participants ranged from less than \$20,000 to more than \$100,000. A total of 97 percent of participants indicated that they were married or their partner is living in the home with them; two percent indicated that they were single, never married. The remaining one percent of participants indicated that they were divorced or preferred not to answer.

The demographic information for the children of the participants that were included in the data analyses are presented in Table 2.

Table 2: Child Demographic Information

	<i>n</i>	%
Was child adopted		
Yes	40	10
No	368	90
Prefer not to answer	2	<1
Assigned Sex at Birth		
Male	168	41
Female	242	59
Intersex	0	0
Prefer not to answer	0	0
Ethnicity		
Hispanic origin	50	12
Not of Hispanic origin	348	85
Prefer not to answer	12	3
Race		
American Indian or Alaska Native	15	4
Asian	17	4
Black or African American	3	0
Middle Eastern	0	0
Native Hawaiian or Pacific Islander	0	0
White	369	90
Another race/ethnicity or Multiple races/ethnicities	5	1
Prefer not to answer	1	<1
Age Group		
0-to-17 months	21	5
18 months-to-2 years	57	14
3-to-5 years	332	81

The participants also provided demographic data on the child about whom they were filling out the survey. Of those children, five percent were in the 0-to-17 months age group, 14 percent in the 18 months-to-2 years age group, and 81 percent in the 3-to-5 years age group. A total of 10 percent of participants indicated that their child was adopted, and two participants chose not to answer. In terms of assigned sex, 59 percent of children were female, and 41 percent were male. The ethnicity distribution was 85 percent not of Hispanic origin, 12 percent Hispanic origin, and

three percent preferred not to answer. The racial distribution of the participants was 90 percent White, four percent Asian, four percent American Indian or Alaskan Native, and two percent selected multiple races/ethnicities or other race/ethnicity. One participant preferred not to answer.

## **Measures**

### ***Patient Health Questionnaire (PHQ-9)***

The PHQ-9 is a 9-item, self-report, criterion-referenced instrument used for assessing severity of depressive symptoms. The measure is scored on a scale from 0 (*not at all*) to 3 (*nearly every day*), with higher scores indicating more depressive symptoms (Kroenke et al., 2001). Instructions for the survey are “Over the last 2 weeks, how often have you been bothered by any of the following problem?” Sample items include “little interest or pleasure in doing things,” and “feeling tired or having little energy.” Scores on the measure have been shown to have excellent internal consistency reliability (0.89) and test-retest reliability over a 48-hour time period (0.84). In terms of construct validity, scores on the PHQ-9 have correlated strongly with scores on measures of mental health such as the Mental Health Inventory (MHI-5; 0.73; Kroenke et al., 2001).

### ***The State-Trait Anxiety Inventory (STAI)***

The STAI is a 40-item measure of state and trait anxiety (20 items for each scale; see Appendix D). Items are rated on a 4-point scale with 1 (*Not At All*) to 4 (*Very Much So*) for the state scale and 1 (*Almost Never*) to 4 (*Almost Always*) for the trait scale. Higher scores on the measure indicate more anxiety symptoms. The measure can be used in research as a tool to evaluate caregiver distress. Sample items on the state anxiety subscale include, “I am tense; I feel upset” and “I am calm; I feel at ease.” Sample items on the trait anxiety subscale include, “I

worry too much over something that really doesn't matter," and "Some unimportant thought runs through my mind and bothers me" (Spielberger et al., 1970). There is evidence to suggest that scores on the measure have good reliability. Internal consistencies (Cronbach's alpha) in Vliegen et al.'s (2005) study were .93 for state anxiety and .92 for trait anxiety. Test-retest reliability has been shown to be excellent for the anxiety trait items (.97) but lower for anxiety state items (.45) over 21 days (Metzger, 1976). In terms of convergent validity, the STAI has been shown to correlate positively with other self-report measures of stress and depression (e.g., Perceived Stress Scale [PSS], BDI; Maynard et al., 2010).

### ***Big Five Inventory 10 (BFI-10)***

The BFI-10 is an abbreviated version of the BFI-44 that is a self-report measure of the Big Five personality domains (extraversion, agreeableness, conscientiousness, neuroticism, openness). The measure consists of 10 items rated on a 5-point Likert-type scale 1 (*disagree strongly*) to 5 (*agree strongly*), with higher scores on each scale indicating a stronger presence of that personality trait (Rammstedt & John, 2007). Example questions include "I see myself as someone who is reserved," and "...is outgoing and sociable." Rammstedt and John (2007) found that the BFI-10 had a strong correlation with the original 44 item version in both U.S. and German samples (0.83), indicating good internal consistency. Scores on the measure also showed acceptable test-retest reliability over six to eight weeks (0.75 overall). In terms of convergent validity, the 10-item scale averaged .67 across the domains with the NEO Personality-Inventory-Revised (NEO-PI-R; Rammstedt & John, 2007).

### ***The Survey of Well-being of Young Children (SWYC)***

The SWYC is a comprehensive screening instrument for children under five years of age. The instrument includes items that assess developmental and emotional/behavioral domains, as

well as family context. This study included items from the Baby Pediatric Symptom Checklist (BPSC), the Preschool Pediatric Symptom Checklist (PPSC), Family Context, and parental concerns. The BPSC is a 12-item measure for children up to 18 months that screens for emotional/behavioral issues across three domains (irritability, inflexibility, and difficulty with routines). Studies have shown that scores on the measure have adequate retest and internal consistency reliability ( $ICC > .70$ ). In terms of construct validity, scores on the measure have been shown to correlate with the Parenting Stress Index and the Ages & Stages Questionnaire: Emotional/Behavioral (Perrin, Sheldrick, Visco, & Mattern, 2016). The PPSC is an 18-item measure for children 18-65 months of age that screens for emotional behavioral issues across four domains (externalizing, internalizing, attention problems, and parenting challenges). Scores on the measure have been shown to have strong internal consistency and have been shown to correlate highly with scores on other longer screeners such as the Ages & Stages Questionnaires: Social-Emotional (Perrin, Sheldrick, Visco, & Mattern, 2016). The Family Context questions are a set of 9 questions that measure family-related issues that could impact children and their parents, including alcohol and drug use, domestic violence, and other psychosocial risk factors. The questions are pulled from other validated sources that are commonly used to measure those symptoms (Perrin, Sheldrick, Visco, & Mattern, 2016). To assess parent concerns, two questions ask if the parents have any concerns about their child's learning, development, or behavior.

### ***Emotional Availability—Self Report (EA-SR)***

Mothers' perceptions of emotional availability were measured via the EA-SR which was described above. The measure contains 36 Likert-type items with responses on a 5-point scale, 1 (*Do not agree at all*) to 5 (*Totally agree*; see Appendix B). According to Vliegen et al. (2005), the EA-SR measures five factors, parent intrusiveness, parent hostility, child's ability to involve

the parent, mutual attunement, and affect quality. A sample item that assesses intrusiveness is, “I seem to have a need to control and lead things and have a hard time backing off” (Vliegen et al., 2005). A sample item for the parent hostility subscale is, “It happens that I shout at my child to make something clear” (Vliegen et al., 2005). A sample item for the child subscale is, “My child is able to get my attention for his/her play or as he goes about the day. A sample item from the mutual attunement subscale is, “I find it hard to understand the needs of my child” (Vliegen et al., 2005). A sample item that measures affect quality is, “My child clearly enjoys being together with me” (Vliegen et al., 2005). Scores on the measure can be used to produce a total score, and individual scores for each subscale. Higher scores (with some items being reverse scored) indicate better EA, versus lower scores (Vliegen et al., 2005). Evidence suggests that scores on the measure have variable reliability with good internal consistency for four of the five subscales (between .71 to .84), but lower internal consistency for the *affect quality* subscale (alpha = .49) (Vliegen et al., 2005).

### ***Instructed Response Items***

To identify bot activity as well as careless or random responding, the survey included three instructed response items as recommended by Meade and Craig (2012). A sample item was “please respond with ‘agree’ for this item.” Meade and Craig (2012) recommend about one such item for every 50 to 100 items up to a maximum of three. Their recommendation was based on their findings that with three such items with five or more response options the probability of a random responder being screened out was close to 1.0 (Meade & Craig, 2012).

### **Procedure**

All participants were recruited via Amazon Mechanical Turk (MTurk). Before beginning the questionnaire, participants received an informed consent form that detailed the purpose and

procedures of the study, as well as any potential risks that were involved with participating in the study, and information about confidentiality, anonymity, and compensation. Participants then completed the demographics questionnaire, as well as the PHQ-9, STAI, BFI-10, and SWYC self-report questionnaires online through Qualtrics. Participants were paid \$5 for fully completing the survey and passing all random responding and attention checks. This study was approved by the Colorado State University IRB prior to data collection.

Data were collected three times, until enough responses were collected that passed attention and random responding checks as well as participation criteria. Due to a high number of participants who did not meet the participation criterion of being a “mother,” an additional question was added that was meant to help screen out participants who did not meet that criterion (“Which of these best describes your parenting role?” with responses being “mother” or “father”), as well as an additional demographics question. Also, after each data collection, data from all respondents who did not meet the inclusion criteria or did not pass attention and random response checks were thrown out. This resulted in a total of 410 cases.

Before data analysis, participants’ MTurk worker IDs were removed, and the retained responses were coded numerically.

### **Data Analysis**

The 410 participants who were retained were randomly placed into two groups of 205. This was deemed a sufficient sample size for factor analysis based on the recommendations of Howard (2016), which stated that the minimum sample size for an Exploratory Factor Analysis (EFA) should be 200 or a 5-to-1 participant-to-variable ratio, with the bigger number being the cutoff; and Sakaluk and Short (2017), who recommended that the sample size be between 200 and 250 participants. The first group was used for the EFA and Confirmatory Factor Analysis

(CFA), and the second group was used to cross-validate the final factor structure. To ensure that the two groups were truly divided randomly and equally representative of the full sample, a series of *t*-tests and chi-squares were run in SPSS 29 to compare the demographics of the two groups. All participants' data were used for validity and reliability analyses.

### ***Factor Structure***

The factor structure of the EA-SR was first analyzed using two methods of EFA. The first method was to run an EFA in Mplus 8.9 using a geomin oblique rotation for one to six factors and examine model fit statistics. Model fit and item loadings were compared to determine the best model. The second method was a Parallel Analysis in SPSS 29 using a promax oblique rotation. A scree plot was generated, and eigenvalues were examined to identify the best fitting model. Items loadings were then examined and items that did not load well or meet fit criteria were removed. Based on the results of the EFA, a series of CFAs was run in Mplus 8.9 on the first half of the data. The different models were compared based on model fit statistics and the best fitting model was retained. Additional items were then removed until adequate model fit was achieved. A CFA was then run on the data supplied by the second half of the sample for cross-validation. A final CFA was then run post-hoc with mothers of children ages 3-to-5 across the entire sample.

### ***Reliability and Validity***

To establish convergent and discriminate validity, a series of correlations were run in SPSS 29 between the subscales of the best fitting model that was established with EFA and CFA and the subscales of the PHQ9, STAI, SWYC, and Big 5 personality traits. Reliability was examined by assessing Cronbach's alpha of the scores on the subscales of the best fitting model.

### ***Invariance Testing***

The proposed plan for measuring invariance across the age groups was to separate the participants into three groups based on their child's age. The age groups were anticipated to be 0-to-17 months, 18 months-to-2 years, 11 months, and 3-to-5 years. The plan was to perform a multigroup CFA in Mplus 8.9. However, due to the extremely unequal distribution of participants across age groups, it was not possible to proceed with these analyses and therefore, invariance testing was not able to be completed.

## RESULTS

The purpose of this study was to expand the use of the EA-SR for use with children 0-to-5 years of age by providing evidence of reliability and validity of the scores on the measure for this age group. In order to achieve this an EFA and a series of CFAs were conducted to determine the factor structure of the EA-SR. Convergent and discriminant validity was assessed by examining correlations between the EA-SR and other relevant measures.

Before data analyses were performed, the data were randomly split into two groups. To ensure that this process successfully achieved two equivalent groups, a series of *t*-tests and chi-square analyses were conducted to compare the demographics. The *t*-tests and chi-square analyses indicated that there were no significant differences between demographic measures of the first and second group.

### **Factor Structure of the EA-SR**

This section will report the findings regarding factor structure and item loadings of the EA-SR. Before factor analysis could be conducted, steps were taken to ensure the data were suitable for factor analysis. The initial solution demonstrated that the matrix was factorable. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy fell within the excellent range at .839 and Bartlett's Test of Sphericity- $\chi^2$  was significant (( $N = 205$ ) = 3004.593,  $p < .001$ ).

Two methods of EFA were conducted to a) determine the number of factors that best fit the data, and b) identify any items that were a poor fit. The initial EFA was conducted on the first half of the sample, which included 205 participants, in Mplus 8.9. Model fit and item loadings were compared to determine the best model using the following criteria (Du Toit et al., 1999): Comparative Fit Index (CFI; values above .95 indicating good model fit, above .90

acceptable fit), and the Root Mean Square Error of Approximation (RMSEA; below .05 indicating a good fit, and values below .08 indicating an acceptable fit). The two, three and the five-factor solutions were found to have the best fit and least number of cross loadings. Item loadings were examined using the .40-.30-.20 rule, which states that acceptable items a) load onto their primary factor above 0.40, b) load onto alternative factors below 0.30, and c) demonstrate a difference of 0.20 between their primary and alternative factor loadings (Howard, 2016). Using these rules it was determined that not enough items loaded onto all of the factors of the three- and the five-factor solutions. Due to this the two-factor solution was retained at this point. The second method of determining the best number of factors was Parallel Analysis (PA). I ran this in SPSS 29, generated a scree plot (Figure 1), and examined the eigenvalues.

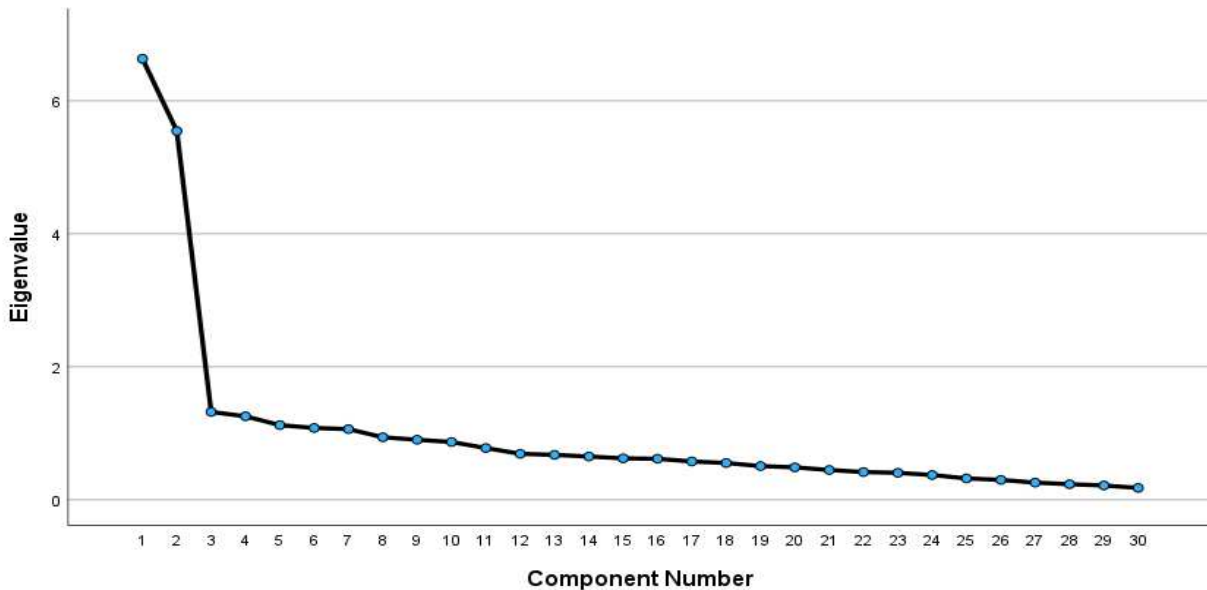


Figure 1: Parallel Analysis on 36-item EA-SR

The PA showed a clear two-factor solution which was in agreement with the results from the EFA run in Mplus 8.9. These two factors explained 40.59% of the variance. An examination of the item loadings showed that two of the items did not meet the fit criteria (Howard, 2016). Item

16 and item 21 were therefore removed, resulting in 34 remaining items. See Table 3 for factor loadings for the two-factor 36-item EA-SR.

*Table 3: EFA Factor Loadings for the Two-Factor 36-Item Scale*

Item	Factor 1	Factor 2
#15: It happens that I become agitated or frustrated, when I am with my child.	<b>-.733</b>	.184
#13: I often find my child annoying.	<b>-.725</b>	.064
#12: I sometimes use injuring words to my child.	<b>.720</b>	-.031
#18: Now and then, my child elicits more anger in me than I would like.	<b>.716</b>	-.012
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	<b>-.676</b>	.029
#34: Sometimes, my child brings about angry reactions in me.	<b>.673</b>	.083
#6: It happens that I react in an angry way to my child.	<b>.638</b>	-.098
#33: My child never asks me to play, talk, or interact.	<b>-.615</b>	.130
#31: I seem to have a need to control and lead things and have a hard time backing off.	<b>.597</b>	.134
#4: I find it hard to understand the needs of my child.	<b>-.561</b>	.089
#29: It happens that I raise my voice to my child.	<b>.553</b>	.045
#26: My child cries, whines, moans, and complains a lot to me.	<b>-.539</b>	-.157
#10: When my child shows difficult or oppositional behavior, I sometimes don't know how to cope with the conflict.	<b>-.523</b>	-.049
#24: It happens that I shout to my child to make myself clear.	<b>.495</b>	.170
#22: I find it hard to see my child playing or being on his own, I prefer to do things together when we're at home.	<b>.479</b>	.049
#16: I wonder whether my child enjoys my presence.	-.403	-.326

#21: I find it hard to structure my child's behaviors and actions when they do things that are not allowed and/or are dangerous.	-.185	.018
#19: My child calls me to come and play, talk, and/or interact.	-.087	<b>.670</b>
#9: My child tries to communicate with me.	-.060	<b>.637</b>
#27: My child brings, shows and involves me in their interests.	.087	<b>.631</b>
#3: My child clearly enjoys being together with me.	-.209	<b>.607</b>
#36: My child often expresses their desire to play, talk and/or interact with me.	-.049	<b>.601</b>
#7: I'm happy with my child.	-.173	<b>.594</b>
#28: My child often asks me to look at what they are playing or doing.	.101	<b>.590</b>
#23: I always want to know what my child is up to or is thinking.	.131	<b>.550</b>
#32: My child can easily be involved in playing or as they go about other activities.	.150	<b>.549</b>
#5: I like to see my child playing or being on their own.	.068	<b>.522</b>
#14: When I'm at home together with my child, we interact and talk to each other a lot.	-.045	<b>.516</b>
#8: By using their body language, my child is able to show me they want to play, talk, or interact.	-.037	<b>.509</b>
#1: I like to have eye-contact with my child.	-.079	<b>.477</b>
#17: My child is able to get my attention for their play or as they go about the day.	.032	<b>.476</b>
#11: Parents always have to present their children new challenges and to show the way.	.067	<b>.475</b>
#35: Parents constantly have to offer their child new challenges.	.229	<b>.475</b>
#2: I succeed in adjusting to my child's behaviors and actions when necessary.	-.052	<b>.458</b>
	.059	<b>.439</b>

#30: When my child seems sad, worried, or upset, I can usually figure it out.	-.045	<b>-.432</b>
#25: My child claims my attention.		

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The next step in identifying the best-fitting model for the data was to conduct Confirmatory Factor Analyses with the 34 remaining items. Primarily the goal was to use CFA to examine the fit of the two-factor model identified in EFA, however several alternative theoretically plausible models were tested as well. The models that were tested included a one-factor model, a two-factor model based on results of the EFA, a three-factor model as proposed by Punamäki and colleagues (2019, 2021) and Qouta and colleagues (2021), a five-factor model based on Vliegen et al. (2005), and a six-factor model based on the dimensions of the EA observational system. Fit indices for the models tested are presented in Table 4. Model fit and item loadings were compared to determine the best model using the following criteria (Du Toit et al., 1999): Comparative Fit Index (CFI; values above .95 indicating good model fit, above .90 acceptable fit), and the Root Mean Square Error of Approximation (RMSEA; below .05 indicating a good fit, and values below .08 indicating an acceptable fit).

The two-factor CFA including 34 items was not an adequate fit based on fit criteria; however it showed the best fit compared to the other models that were tested (RMSEA = 0.072, CFI = 0.780, TLI = 0.765). The one-factor (RMSEA = 0.102, CFI = 0.524, TLI = 0.493), three-factor (RMSEA = 0.085, CFI = 0.694, TLI = 0.672), and five-factor (RMSEA = 0.088, CFI = 0.675, TLI = 0.648) all indicated poor fit and were a worse fit than the two-factor model. The six-factor model produced the following message in Mplus 8.9 (“No convergence. Number of iterations exceeded”).

Table 4: Fit Indices for Models Tested with CFA

Model	RMSEA	CFI	TLI
One-Factor	0.102	0.524	0.493
Two-Factor	<b>0.072</b>	<b>0.780</b>	<b>0.765</b>
Three-Factor	0.085	0.694	0.672
Five-Factor	0.085	0.675	0.648
Six-Factor	Na	Na	Na

To achieve better model fit for the two-factor model item loadings were reviewed and any items that loaded less than 0.5 on their intended factor were eliminated, resulting in 26 items. Table 5 shows the item loadings for the two-factor 34-item scale. The CFA with 26 items was a slightly better fit than the 34-item (RMSEA = 0.073, CFI = 0.832, TLI = 0.816). Table 6 shows the item loadings for the two-factor 26-item scale.

Table 5: CFA Factor Loadings For the Two-Factor 34-Item Scale

Item	Factor	Factor Loading
#1: I like to have eye-contact with my child.	Factor 1	.515
#2: I succeed in adjusting to my child's behaviors and actions when necessary.	Factor 1	.464
#3: My child clearly enjoys being together with me.	Factor 1	.622
#5: I like to see my child playing or being on their own.	Factor 1	.511
#7: I'm happy with my child.	Factor 1	.603
#8: By using their body language, my child is able to show me they want to play, talk, or interact.	Factor 1	.521
#9: My child tries to communicate with me.	Factor 1	.649
#11: Parents always have to present their children new challenges and to show the way.	Factor 1	.475
#14: When I'm at home together with my child, we interact and talk to each other a lot.	Factor 1	.524

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#17: My child is able to get my attention for their play or as they go about the day.		
#19: My child calls me to come and play, talk, and/or interact.	Factor 1	.489
#23: I always want to know what my child is up to or is thinking.	Factor 1	.683
#25: My child claims my attention.	Factor 1	.521
#27: My child brings, shows and involves me in their interests.	Factor 1	-.415
#28: My child often asks me to look at what they are playing or doing.	Factor 1	.622
#30: When my child seems sad, worried, or upset, I can usually figure it out.	Factor 1	.581
#32: My child can easily be involved in playing or as they go about other activities.	Factor 1	.433
#35: Parents constantly have to offer their child new challenges.	Factor 1	.537
#36: My child often expresses their desire to play, talk and/or interact with me.	Factor 1	.441
#4: I find it hard to understand the needs of my child.	Factor 1	.610
#6: It happens that I react in an angry way to my child.	Factor 2	.581
#10: When my child shows difficult or oppositional behavior, I sometimes don't know how to cope with the conflict.	Factor 2	-.657
#12: I sometimes use injuring words to my child.	Factor 2	.525
#13: I often find my child annoying.	Factor 2	-.722
#15: It happens that I become agitated or frustrated, when I am with my child.	Factor 2	.738
#18: Now and then, my child elicits more anger in me than I would like.	Factor 2	.752
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	Factor 2	-.717
#22: I find it hard to see my child playing or being on his own, I prefer to do things together when we're at home.	Factor 2	.679
#24: It happens that I shout to my child to make myself clear.	Factor 2	-.472
#26: My child cries, whines, moans, and complains a lot to me.	Factor 2	-.460
#29: It happens that I raise my voice to my child.	Factor 2	.506

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#31: I seem to have a need to control and lead things and have a hard time backing off.	Factor 2	-.535
#33: My child never asks me to play, talk, or interact.	Factor 2	-.573
#34: Sometimes, my child brings about angry reactions in me.	Factor 2	.638
	Factor 2	-.660

*Table 6: CFA Factor Loadings For the Two-Factor 26-Item Scale*

Item	Factor	Factor Loading
#1: I like to have eye-contact with my child.	Factor 1	.523
#3: My child clearly enjoys being together with me.	Factor 1	.671
#5: I like to see my child playing or being on their own.	Factor 1	.510
#7: I'm happy with my child.	Factor 1	.607
#8: By using their body language, my child is able to show me they want to play, talk, or interact.	Factor 1	.503
#9: My child tries to communicate with me.	Factor 1	.634
#14: When I'm at home together with my child, we interact and talk to each other a lot.	Factor 1	.520
#19: My child calls me to come and play, talk, and/or interact.	Factor 1	.689
#23: I always want to know what my child is up to or is thinking.	Factor 1	.521
#27: My child brings, shows and involves me in their interests.	Factor 1	.616
#28: My child often asks me to look at what they are playing or doing.	Factor 1	.573
#32: My child can easily be involved in playing or as they go about other activities.	Factor 1	.530
#36: My child often expresses their desire to play, talk and/or interact with me.	Factor 1	.585
#4: I find it hard to understand the needs of my child.	Factor 2	.576

#6: It happens that I react in an angry way to my child.	Factor 2	-.665
#10: When my child shows difficult or oppositional behavior, I sometimes don't know how to cope with the conflict.	Factor 2	.524
#12: I sometimes use injuring words to my child.	Factor 2	-.710
#13: I often find my child annoying.		
#15: It happens that I become agitated or frustrated, when I am with my child.	Factor 2	.744
	Factor 2	.765
#18: Now and then, my child elicits more anger in me than I would like.	Factor 2	-.726
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	Factor 2	.668
#26: My child cries, whines, moans, and complains a lot to me.	Factor 2	.499
#29: It happens that I raise my voice to my child.	Factor 2	-.515
#31: I seem to have a need to control and lead things and have a hard time backing off.	Factor 2	-.566
#33: My child never asks me to play, talk, or interact.	Factor 2	.637
#34: Sometimes, my child brings about angry reactions in me.	Factor 2	-.667

Since the model still did not meet fit criteria, item loadings were again reviewed, and this time any items that loaded less than 0.6 on their factors were removed, resulting in 13 remaining items (Chin, Gopal, & Salisbury, 1997). See Table 7 for the item loadings for the 13-item scale.

*Table 7: CFA Factor Loadings For the Two-Factor 13-Item Scale*

Item	Factor	Factor Loading
#3: My child clearly enjoys being together with me.	Factor 1	.740
#7: I'm happy with my child.	Factor 1	.649
#9: My child tries to communicate with me.	Factor 1	.622
#19: My child calls me to come and play, talk, and/or interact.	Factor 1	.680

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#27: My child brings, shows and involves me in their interests.	Factor 1	.583
#6: It happens that I react in an angry way to my child.	Factor 2	.648
#12: I sometimes use injuring words to my child.	Factor 2	.690
#13: I often find my child annoying.	Factor 2	-.766
#15: It happens that I become agitated or frustrated, when I am with my child.	Factor 2	-.806
#18: Now and then, my child elicits more anger in me than I would like.	Factor 2	.735
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	Factor 2	-.659
#33: My child never asks me to play, talk, or interact.	Factor 2	-.628
#34: Sometimes, my child brings about angry reactions in me.	Factor 2	.628

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Another CFA was run with the remaining items. This model provided a good fit for the data according to Hu and Bentler's (1999) criteria (RMSEA = 0.051, CFI = 0.965, TLI = 0.957). Since EFA and CFA were used to make changes to the original model tested using the first half of the split sample, validation of the final model used the second half of the data. The fit in the cross-validation half was slightly better than in the first half of the data (RMSEA = 0.039, CFI = 0.977, TLI = 0.972).

### **EA-SR Short Form Subscales**

Based on results of factor analysis, only two factors were retained. The subscales are described below. Table 8 shows the items that load onto each factor.

*Table 8: The 13-Item Emotional Availability Self-Report Short Form*

Item	Factor
#3: My child clearly enjoys being together with me.	Emotional Connection and Engagement
#7: I'm happy with my child.	Emotional Connection and Engagement
#9: My child tries to communicate with me.	Emotional Connection and Engagement
#19: My child calls me to come and play, talk, and/or interact.	Emotional Connection and Engagement
#27: My child brings, shows and involves me in their interests.	Emotional Connection and Engagement
#6: It happens that I react in an angry way to my child.	Negative Emotional Reactivity
#12: I sometimes use injuring words to my child.	Negative Emotional Reactivity
#13: I often find my child annoying.	Negative Emotional Reactivity
#15: It happens that I become agitated or frustrated, when I am with my child.	Negative Emotional Reactivity
#18: Now and then, my child elicits more anger in me than I would like.	Negative Emotional Reactivity
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	Negative Emotional Reactivity
#33: My child never asks me to play, talk, or interact.	Negative emotional reactivity
#34: Sometimes, my child brings about angry reactions in me.	Negative emotional reactivity

### ***Emotional Connection and Engagement***

The first subscale, named *emotional connection and engagement*, consists of five items. Three of the items overlap with the original five factor subscale of *child involvement with parent* and two items overlap with *affect quality*. This subscale combines the mothers' perceptions of positive emotional connection with the child as well as the child's ability to involve the parent and engage with them in a way that fosters connection and emotional closeness.

### ***Negative Emotional Reactivity***

The second subscale consists of eight items. Four items overlap with the five-factor subscale of *hostility*, three overlap with *mutual attunement*, and one with *child involvement with parent*. This subscale contains four items that loaded negatively onto the factor indicating that they needed to be reverse coded. While all the items were worded negatively it seems that the non-reverse coded items asked about the parent's behaviors (e.g., "using injuring words to my child"), while the reverse coded items asked about the parents' internal experiences such as emotional experiences and their internal interpretation of their child's behavior ("I often find my child annoying"). It may be that parents that are more emotionally available are more likely to acknowledge that at times they experience negative emotions towards their child, but this does not decrease the perceived quality of their overall relationship or lead to them behaving in "hostile" ways. This is supported by the original definition of caregiver non-hostility, that states that being non-hostile refers to parents being able to express their negative emotions in an emotionally regulated way. Additionally, an important component of this for older children is the caregiver's ability to explain their emotions and reactions as opposed to being reactive (Biringen, 2000).

## Correlation Between Dimensions

The two subscales of the EA-SR short form are significantly correlated, with a correlation of  $r = -.27$ . This suggests that the subscales capture different aspects of emotional availability and are only slightly related to each other.

## Construct Validity

Tables 9, 10, and 11 display the correlation matrix for the correlations between the EA-SR short form subscales and maternal depression, anxiety, personality traits, as well as the subscales of the SWYC. *Emotional connection and engagement* was negatively correlated with maternal depression ( $r = -.27$ ) and with both state ( $r = -.42$ ) and trait anxiety ( $r = -.35$ ). The subscale was only very weakly correlated with the personality traits of extraversion ( $r = .07$ ) and openness ( $r = .10$ ), but was moderately positively correlated with agreeableness ( $r = .38$ ), and had a small positive correlation with conscientiousness ( $r = .28$ ) and a small negative correlation with neuroticism ( $r = -.28$ ). The subscale was not correlated or was very weakly negatively correlated with maternal perceptions of emotional behavioral issues ( $r = -.05$ ) and family context ( $r = -.19$ ). There was a positive moderate association with how many days a week mothers read to their children ( $r = .30$ ) and *emotional connection and engagement*. This pattern of relationships suggests that the *emotional connection and engagement* scale is measuring a pattern of responses that reflects broadly adaptive types of engagement between the mother and child, consistent with the aims of positive emotional availability.

*Negative emotional reactivity* had a positive moderate-to-strong correlation with depression ( $r = .61$ ) and state ( $r = .51$ ) and trait ( $r = .50$ ) anxiety. The subscale was also positively correlated with the personality trait of neuroticism ( $r = .37$ ) and negatively correlated with conscientiousness ( $r = -.38$ ) and agreeableness ( $r = -.44$ ). Openness and extraversion had a

weak or very weak but negative correlation with the subscale ( $r = -.19$ ,  $r = -.12$ ). *Negative emotional reactivity* had a weak positive correlation with mothers' perception of emotional behavioral issues ( $r = .17$ ) and a moderate positive correlation with parental concerns about child development ( $r = .41$ ) and family context ( $r = .41$ ). The correlation between *negative emotional reactivity* and how many days a week parents read to their child was small but significant with a negative association ( $r = -.26$ ). This pattern of relationships suggests that the *negative emotional reactivity* subscale produces scores that reflect a suboptimal type of emotional availability in the mother-child relationship, and may be indicative of possible accompanying mental health concerns, behavioral issues, and risk of poor outcomes.

*Table 9: Descriptive Statistics and Correlations with Depression and Anxiety*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. ECE	21.26	2.98	—				
2. NER	25.70	7.33	-.27**	—			
3. Depression	11.93	6.51	-.27**	.61**	—		
4. Anxiety - State	41.04	9.73	-.42**	.51**	.73**	—	
5. Anxiety - Trait	43.87	8.78	-.35**	.50**	.71**	.84**	—

\* $p < .05$ . \*\* $p < .01$ .

*Note:* ECE = Emotional Connection and Engagement, NER = Negative emotional reactivity

Table 10: Descriptive Statistics and Correlations with Personality Traits

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. ECE	21.26	2.98	—						
2. NER	25.70	7.33	-.27**	—					
3. Extraversion	6.15	1.28	.07	-.12*	—				
4. Agreeableness	6.81	1.63	.38**	-.44**	.26**	—			
5. Conscientiousness	7.01	1.59	.28**	-.38**	.18**	.42**	—		
6. Neuroticism	5.19	1.69	-.25**	.36**	-.27**	-.52**	-.51**	—	
7. Openness	6.34	1.24	.10*	-.20**	.24**	.21**	.12*	-.13**	—

\* $p < .05$ . \*\* $p < .01$ .

Note: ECE = Emotional Connection and Engagement, EAR = Negative emotional reactivity

Table 11: Descriptive Statistics and Correlations with SWYC Subscales

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. ECE	21.26	2.98	—					
2. NER	25.70	7.33	-.27**	—				
3. BPSC/PPSC	19.28	49.12	-.05	.17**	—			
4. Parental Concern	2.41	1.21	-.12*	.41**	.06	—		
5. Family Context	6.04	2.41	-.19**	.41**	.07	.35**	—	
6. Reading	3.53	1.77	.30**	-.26**	-.10	-.08	-.07	—

\* $p < .05$ . \*\* $p < .01$ .

Note: ECE = Emotional Connection and Engagement, NER = Negative emotional reactivity, BPSC/PPSC = Baby Pediatric Symptom Checklist/Preschool Pediatric Symptom Checklist

### **Internal Consistency/Reliability of the EA-SR Short Form Subscales**

Tables 9, 10, and 11 show the mean scores and standard deviations of the two subscales. The Cronbach's alpha of the *emotional connection and engagement* subscale has an acceptable reliability at an alpha of .77. The *negative emotional reactivity* subscale has good reliability with an alpha of .88.

### **Measurement Invariance**

The initial data analysis plan included assessing measurement invariance by conducting a series of multi-group CFAs. However, I was not able to conduct this analysis due to the uneven distribution of participants across the age groups, and the two younger groups not having enough participants to have a sufficient sample size for a multigroup CFA. There were 21 participants in the 0-to-17 months age group, 57 participants in the 18 months-to-2 years age group and 332 participants in the 3-to-5 years age group. The general suggested cut-off for number of participants for a multi-group CFA is 100 per group. Based on this rule of thumb, the younger two groups did not have nearly enough participants to produce valid and interpretable results (Kyriazos, 2018).

### **Post-hoc Analyses**

Due to the composition of the age groups it was determined that the results were likely more representative of the 3-to-5 years age group. However, both halves of the sample included in the analyses contained a small portion of mothers of children who were younger than three. In order to ensure that the 13-item two-factor model was a good fit for this age group, another CFA was run post-hoc which included only mothers of children 3-to-5 years. The number of participants was 332. According to Hu and Bentler's (1999) criteria this CFA showed great fit, which was slightly better than both the CFA run on the first and second half of the data that

included all age groups (RMSEA = 0.035, CFI = 0.982, TLI = 0.977). See Table 12 for item loadings.

*Table 12: CFA Factor Loadings For the Two-Factor 13-Item Scale (3-to 5-year-olds only)*

Item	Factor	Factor Loading
#3: My child clearly enjoys being together with me.	Factor 1	.641
#7: I'm happy with my child.	Factor 1	.647
#9: My child tries to communicate with me.	Factor 1	.539
#19: My child calls me to come and play, talk, and/or interact.	Factor 1	.680
#27: My child brings, shows and involves me in their interests.	Factor 1	.584
#6: It happens that I react in an angry way to my child.	Factor 2	.665
#12: I sometimes use injuring words to my child.	Factor 2	.709
#13: I often find my child annoying.	Factor 2	-.778
#15: It happens that I become agitated or frustrated, when I am with my child.	Factor 2	-.775
#18: Now and then, my child elicits more anger in me than I would like.	Factor 2	.709
#20: I find it hard to attune myself to the rhythm of interaction with this particular child.	Factor 2	-.622
#33: My child never asks me to play, talk, or interact.	Factor 2	-.560
#34: Sometimes, my child brings about angry reactions in me.	Factor 2	.623

## DISCUSSION

The primary purpose of the current study was to establish additional evidence of reliability and validity for the EA-SR and determine whether the EA-SR is a valid measure of emotional availability for mothers with children ages 0-to-5 years. To address the goals of the study, the 36-item EA-SR was administered to mothers of children between the ages of zero and five years, along with measures of depression, anxiety, personality, and child development and wellbeing. The factor structure of the EA-SR was examined first using EFA, and subsequently using CFA. The results of the CFA were cross-validated, and patterns of convergent and discriminant correlations were examined. The item pool was condensed based on the findings of the EFA and then further refined based on the CFA.

It was hypothesized that with children ages 0-to-5 years the EA-SR would follow the five-factor structure suggested by Vliegen et al. (2005). However, the findings from the EFA and CFA did not support the hypothesis. Instead, evidence was found that an EA-SR short form consisting of 13 of the original 36 items, loading onto two rather than five factors, may be a valid measure of emotional availability (EA) for mothers with children ages 3-to-5 years. The 13-item short form was found to have good fit to the data to generate scores with strong evidence of internal consistency reliability for both factors. Construct validity was explored by analyzing the correlations between the EA-SR short form and other relevant variables. The findings were mixed with some being in line with hypotheses and some not.

### **Factor Structure and Number of Items**

The results of the study suggested that the best-fitting model of the EA-SR was a short form version that contained 13 items that loaded onto two factors (*emotional connection and*

*engagement* and *negative emotional reactivity*). This was not in line with the hypothesis that the EA-SR for older groups would follow a five-factor structure and that all 36 items would load onto one of those factors (Vliegen et al., 2005).

One possible contributing factor to these findings may have been the relatively small sample size that was used for analysis. Some authors suggest that the sample size can impact factor loadings and can result in instability in factor loading scores (Hirschfeld et al., 2014; Shevlin & Miles, 1998). Sakaluk and Short (2017) also discussed how the sample size of the study may depend on certain data-related conditions and that larger sample sizes may be needed when there are many factors with fewer items such as the five-factor structure found in Vliegen et al. (2014). The sample size for this study was on the smaller end with 205 participants in each group, and may have contributed to the low item loadings particularly in the CFA, which resulted in many items being removed.

However, the sample size in this study was deemed to be adequate based on recommendations from Sakaluk and Short (2017) and Howard (2016), suggesting that the findings of this study are indeed valid. Sakaluk and Short (2017) specifically suggested that researchers aim to have between 200 to 250 participants and adjust that number accordingly depending on the nature of the data and factor solution. They also propose that when a factor solution has few factors with three or more items loading on each, the sample size can be smaller (Sakaluk & Short, 2017). Since the best-fitting solution had two factors with five to eight items loading on each, a sample size of 205 should be adequate. Howard (2016) agreed that a minimum sample cut off of 200 or a 5-to-1 participant-to-variable ratio is sufficient for an EFA. Based on the 5-to-1 ratio and the 36 items in the original EA-SR, the study would have needed at least 180 participants. The 205 participants that were in each group exceeded both the ratio and

the minimum sample size recommendation (Howard, 2016). Since this was an initial study, replication with a larger, independent sample would be beneficial and would provide evidence of how the EA-SR would perform with a larger sample.

Another potential explanation for the smaller number of factors may be the age distribution of the children of the participants in this study. Most of the study participants (81 percent) responded to the survey based on a child between the ages of three and five years, suggesting that the findings of this study are likely more representative of that developmental stage. The construct of EA is closely linked to attachment theory (Biringen, 2000; Biringen & Robinson, 1991; Biringen et al., 2014). According to attachment theory, attachment looks different during different developmental stages of a child's life (Bowlby, 1997). Furthermore, research suggests that there is a major shift in attachment behavior between the ages of two years and three years, with additional changes at ages four and beyond (Marvin et al., 2016). As children get older, particularly after age three, they become less dependent on physical proximity to their caregiver and also gain additional autonomy, due to increased motor and communication skills (Marvin et al., 2016). It is possible that some of the concepts captured by the items on the EA-SR that were removed are more applicable to children before the age of three and were therefore less reflective of EA in the 3-to-5 years age group. For example, one of the items that was removed was "I like to make eye-contact with my child." This may be a more important way of connecting with children that have not yet developed verbal communication skills.

While four of the original five subscales (*hostility, mutual attunement, affect quality, capacity to involve the parent*) found by Vliegen et al (2005) were represented by items in the 13-item scale, one subscale was not represented. None of the items overlapped with the *intrusiveness* subscale, which measures aspects of the *caregiver non-intrusiveness* subscale that

is described as being part of EA in the literature and is part of the six dimensions of the observational EA scales (Biringen, 2000; Biringen et al., 2014). It is possible that when assessed through self-report, mothers may find it harder to identify their own behaviors as being intrusive and overbearing, making that particular scale more difficult to measure through self-report. This is supported by Vliegen et al. (2009) who found that *parent intrusiveness* as reported by the mother was not correlated with *caregiver non-intrusiveness* as scored by an outside observer. Also, children in the three to five age range tend to have more autonomy than children before the age of two, due to their increased motor and communication skills (Marvin et al., 2016). Mothers at this time may feel less need to be involved in every aspect of their child's lives.

Another finding in this study was that the two subscales were found to be significantly but weakly negatively correlated with each other. This is similar to previous findings that found little to no correlation between the subscales of the EA-SR (Vliegen et al., 2005). This finding suggests that while there appears to be some relationship between the factors, this relationship is not very strong. It also indicates that each subscale is measuring a distinct aspect of EA. Also, a small correlation suggests that these dimensions are largely independent, which means that mothers could score high (or low) on both at the same time. What this likely means for EA as a whole is that a relationship between a mother and child is likely never all "good" or all "bad." A relationship can have various strengths and challenges at the same time. With this in mind it is likely that a total score of both dimensions would have limitations in how much information it can provide, and it is likely better to look at scores on both measures separately to get a more nuanced picture of what EA looks like in a particular mother-child relationship.

### *Psychometric Qualities*

Scores on the subscales showed acceptable-to-good internal consistency, generally suggesting that each subscale has good reliability. *Emotional connection and engagement* had slightly lower internal consistency than *negative emotional reactivity*, possibly due to it having fewer items (Nunnally, 1978). Additional research would be needed to replicate the internal consistency of both subscales and further investigate why *negative emotional reactivity* has lower consistency.

**Construct validity.** The second and third hypotheses that focused on construct validity for this study were created assuming a five-factor structure would be found as the best fit. Since a five-factor structure was not supported, these hypotheses were not testable. In order to explore construct validity, correlations were performed between the two subscales of the EA-SR short form and the other measures. The correlations of the subscales with depression and anxiety support the validity of the instrument. As expected, emotional availability was related to scores on the PHQ-9, which measures depression, as well as state and trait anxiety, with generally higher depression and higher anxiety being associated with less emotional availability. This is in line with literature that suggests that EA can be impacted by stress and anxiety as well as the presence of depressive symptoms (Aran et al., 2021; Azhari et al., 2020; Dittrich et al., 2017; Kim & Teti, 2014). The results also indicate that mothers who report higher emotional availability also tend to read to their children more often. The study could not determine the directionality of this relationship, but it is possible that a caregiver who is more emotionally connected with their child would also read more to them. Of course, it is also possible that reading more can foster greater EA, or that a third variable may influence both simultaneously. The causal influences may also be reciprocal. Whatever the causal dynamics, this relationship is

supported by findings that suggest that shared book reading is associated with better parent-child relationships over time as well as less parental stress (Canfield et al., 2020, Weisleder et al., 2019).

Some of the correlations were not in line with the hypotheses, particularly the hypothesis that there would be no relationship between personality traits and the subscales of the EA-SR. While, as expected, neither subscale was correlated with the personality traits of extraversion and openness, there were some unexpected relationships between the subscales and personality traits of agreeableness, conscientiousness, and neuroticism. More specifically, *emotional connection and engagement* was found to be moderately positively correlated with agreeableness. This may be due to the factor generally measuring a mother's perceptions of connectedness, closeness and engagement with their child. The Big 5 personality measure suggests that people who score higher on agreeableness tend to be more cooperative and trustful and tend to express more affection (John & Srivastava, 1999). Considering that *emotional connection and engagement* contains aspects of the Vliegen et al. (2005) subscales of *affect quality* and *child involvement with parent*, which measures qualities such as warm and positive affectivity, acceptance of the child, and the child's ability to capture the parent's attention, it follows that the personality trait of agreeableness might be positively correlated with these qualities. *Negative emotional reactivity* in the meantime was negatively correlated with agreeableness, which is fitting and likely explained by the negative relationship between the two subscales and the characteristics discussed above regarding agreeableness.

*Negative emotional reactivity* was also found to be positively correlated with neuroticism. This trait is generally associated with negative affectivity, including anxiety and sadness. People who score high on this trait also may have a harder time with stress and have more negative

interpretations of situations (John & Srivastava, 1999). Considering that the subscale was also correlated with depression and anxiety and makes sense that individuals that perceive worse relationship quality with their child may also be more likely to hold the characteristics of neuroticism. *Negative emotional reactivity* was also negatively related with the personality trait of conscientiousness. Conscientious individuals are generally understood to be responsible and dependable (John & Srivastava, 1999). It is possible that mothers who perceive worse relationship quality with their child may have less of the qualities associated with being conscientious. More research is necessary to establish the connection between these characteristics and what this could mean for mother-child relationships.

It was also predicted that scores on the subscales of the EA-SR would correlate with scores on the subscales of SWYC. As expected, *negative emotional reactivity* was positively correlated with family risk factors and parental concern. However, *emotional connection and engagement* only correlated very weakly with parental concern, parental perceptions of emotional behavioral issues, and family factors. *Negative emotional reactivity* was also only weakly correlated with parental perceptions of emotional behavioral issues. This suggests that mother's perceptions of emotional connection and engagement with their child may not be necessarily closely related with their perceptions of developmental concerns.

### **Implications for Research and Practice**

Existing research has demonstrated the importance of emotional availability within both parenting and child development. One of the original goals of creating the EA-SR was to make available an accessible tool for measuring emotional availability that does not require the extensive training that is necessary to use the observational EA scales (Vliegen et al., 2005). The 36-item version of the measure has already garnered attention from researchers who are

interested in the construct of emotional availability (e.g., Punamäki et al., 2017; Punamäki et al., 2019; Qouta et al., 2021). A short form version of the measure further contributes to the goals of having an accessible and quick-to-use tool for measuring EA. Generally, attention and data quality tend to decline the longer the survey. Longer studies also tend to have more participants drop out. Having a short form version of the EA-SR measure could therefore be useful in maintaining participant attention and reducing attrition, both valuable attributes for researchers who want to examine or include EA in their research. There are also other advantages to self-report measures beyond practicality that researchers could benefit from. The literature suggests that people are generally best-qualified to provide information about themselves due to the richness and breadth of information that is available to them about themselves that others may not have (internal experiences, behaviors performed in private, etc.). Also, people are often highly motivated to provide details about themselves, and may put a great deal of effort into reporting on their own behaviors and personalities, more so than might be the case with outside observers (Paulhus & Vazire, 2007). These factors put together suggest that having a short form of the EA-SR could contribute to being able to gather more accurate and quality data on EA more efficiently than is potentially possible with the EA observational method.

In terms of practice, the advantages of a brief questionnaire are similar; the efficiency fosters compliance and rapport, and the self-report method contributes to motivation. The parent-child relationship is of interest to practitioners in many disciplines, including the medical field, mental health, and education. The short form of the EA-SR could be used as an assessment tool to gather preliminary or baseline information regarding mother-child relationship quality. This information can have several practical uses such as helping inform interventions and recommendations for clients in pediatric care, but also for practitioners working with parents.

Since the measure is relatively short and easy to administer it could potentially be used as part of intake paperwork or as a way to track progress over time. However, at this time more research is needed to examine how the measure performs across time, and whether it can be used as an outcome measure.

### **Limitations and Directions for Future Research**

The present study makes a unique contribution to the emotional availability literature broadly and to research using the EA-SR specifically. However, there are limitations that may temper the conclusions that can be drawn. Some of these were rooted in the data collection phase. The first challenge was that despite participation criteria being stated in the study posting and consent paperwork, many people who completed the survey during the first data collection phase did not meet participation criteria (e.g., individuals who identify as male and/or fathers), and therefore their data could not be used. The addition of a question asking participants to identify whether the role of mother or father fits them best made it easier to weed out participants that did not meet that particular research criteria, however this did not deter individuals from attempting to complete the survey that did not meet participation requirements. Future research may look into various ways to further circumvent this issue, such as using a platform that provides the option to prevent people who do not meet inclusion criteria from seeing the posting for the study (e.g., Prolific, Qualifications in MTurk).

Amazon's Mechanical Turk service was chosen as the platform for recruiting participants for this study, due to its relative low cost and ability to reach a lot of potential participants of various identities. However, a possible risk of using a platform such as this and a challenge that came up was identifying bot activity as well as random responding and participant inattention to items. Bot activity has become an increasing issue within academic research due to the

prevalence of online data collection and the increased sophistication of bots (Irish & Saba, 2023). Therefore, it was important to select an effective method for identifying potential bot activity. The method that was used in this study to identify unusable responses was to include Instructed Response Items (Meade & Craig, 2012), as well as other inattention checks such as looking for straightlining (i.e., when survey responders give the same response to a group of questions) and very quick completion times. This resulted in a good number of responses being excluded from data analysis due to not passing those attention checks. Future research may explore other methods for identifying bot activity and ensuring respondent attention and therefore data quality, such as using pre-screening questions or qualification tests that are offered by MTurk for an extra cost.

One of the limitations of this study was that invariance testing was not able to be achieved due to the composition of the age groups. The uneven distribution resulted in part from data being collected for all three groups simultaneously with the same survey, without implementing procedures to ensure a balanced distribution. In the future to address this issue it would be beneficial to collect data specifically for each age group separately to ensure that each group has a sufficient number of participants. Also, since most of the participants were in the 3-to-5 years age group, this study cannot provide sufficient evidence for the psychometric properties of the EA-SR short form as it relates to the 0-to-17 months and the 18 months-to-2 years age group. It should also be noted that while the results of this study are being interpreted as mostly being characteristic of the 3-to-5 years age group, there were a small number of mothers of younger children in the sample, which may have impacted the results in some way. Therefore, to further confirm that the model was indeed a good fit for the 3-to-5 years age group, additional analyses were run post-hoc on a combined single sample that included only that age

group. The results showed that the model was a great fit, providing additional evidence of the model's fit with this age group. It should be noted that there is some debate in the field regarding the validity of post-hoc hypotheses and analyses due to the risk of finding false positives (Simmons et al., 2011). Therefore, replication is needed in future studies of the analyses with mothers of only 3-to 5-year-olds to verify these findings.

Most of the participants in this study self-identified as White; caution should be used in generalizing these results to other populations. Future studies should target a more diverse population to assess the applicability of this measure across various ethnic and cultural identities. This is crucial, because previous studies have demonstrated that the factor structure of the EA-SR may vary across different cultures. For example, Vliegen et al. (2005) had a sample of Belgian mothers, whereas the current study had a predominantly U.S. sample, highlighting the need to examine whether these differences are consistent across different cultural contexts. Also, cultures across the world tend to differ in terms of parenting practices and attachment (Rothbaum et al., 2000). These variations in child-rearing practices and expectations likely influence the child-parent relationship and may impact how EA shows up across cultures. Understanding these cultural differences is essential to ensure that the EA-SR is a valid and reliable tool that can be used across various cultures and ethnic groups.

Other differences that may be worth exploring include socioeconomic status (SES), and differing family dynamics (e.g., caregivers' relationships with partners) which have been shown to be linked with EA (Kim et al., 2017; Mingo & Easterbrooks, 2015; Negrao et al., 2016). Exploring these variables in future research could provide a more comprehensive understanding of how contextual factors impact EA and its measurement.

Other possible research directions include assessing the validity of the EA-SR short form for use with children older than five as well as adolescents. The literature suggests that attachment differs across developmental stages (Bowlby, 1997; Marvin et al., 2016). Since EA is so closely linked with attachment research, it is possible that EA might also look different across developmental stages. The current study provided some preliminary evidence that EA as a construct may be less nuanced in children ages 3-to-5 years compared to children 0-to-18 months of age. Considering this, it would be prudent for future studies to examine this further and compare how EA shows up across different developmental stages.

This study and other validation studies of the EA-SR only focused on mothers and their children. However emotional availability is a construct that is meant to apply to other caregivers as well. Also, while statistically mothers are still in the primary caregiver role in most cases, the amount of fathers and grandparents that are in the primary caregiver role has been on the rise across the world. Additionally, other caregivers have been shown to be important in child development even when they are not the primary caregiver (Buchanan & Rotkirch, 2018; Sanders & Morawska, 2018). Therefore, it is important for future studies to be more inclusive in terms of caregivers and should include other caregivers in their samples (e.g., fathers, grandparents). Overall, exploring these various factors (i.e., different age groups, cultural and SES factors, different caregivers and family dynamics) would enhance the generalizability of the EA-SR and ensure its effectiveness in diverse settings, ultimately contributing to more inclusive and accurate assessment of EA.

Another consideration for future research is to further explore the practical significance of the observed effect sizes. This study used Cohen's effect size guidelines, which are still widely used in the field, to interpret their magnitude. However, Cohen's effect

size guidelines have some noteworthy limitations. Funder and Ozer (2019) recommend revised guidelines of interpreting effect sizes where an effect size of .05 is small, .10 is considered small, .20 is medium, and .30 is large, and .40 or greater is a very large effect size likely to represent an overestimation. Future research may consider investigating the practical significance of the effects observed within this area of research, and consider which guidelines for interpreting effect sizes are the most accurate or useful.

Future research should also investigate how this 13-item short form corresponds with the observational EA Scales. This is an important step to take to establish additional validity evidence for this measure, particularly with respect to criterion-related validity. This would also show how similar or different the EA-SR is from the observational EA Scales. That is, to what extent is the EA-SR measuring the same thing as observational EA? It is important to clarify whether it is possible to use EA-SR and observational EA Scales interchangeably, or if they represent distinct constructs that should be clearly differentiated both in the research literature and in practice.

## CONCLUSION

The present study contributed to the emotional availability literature by providing initial evidence that a short form 13-item version of the EA-SR may be a valid and reliable measure of EA for children ages 3-to-5. Factor analysis revealed two dimensions of the short form which were *emotional connection and engagement*, and *negative emotional reactivity*. At this time, replication of this study and further validation is warranted to provide additional support for the use of the EA-SR short form. Future research could also continue to explore how the EA-SR short form performs with different age groups of children and with different caregivers to possibly expand the utility of the measure and provide additional evidence of validity. Also, these findings suggest that there may be some difference in how EA presents in mother-child relationships across different developmental stages, which is a potentially interesting direction that future studies could continue to explore.

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## APPENDIX A

### Demographics Parent and Child Demographics

Are you 18 years of age or older?

- Yes
- No

What is your current age? (in years) \_\_\_\_\_

What is your gender? \_\_\_\_\_

When we describe who participated in our study: Which of these categories would you like us to include you in?

- A cisgender category (refers to people who are the same gender and/or sex they were assigned at birth)
- A trans/transgender category (usually refers to people who were given a gender and/or sex label at birth that does not accurately represent them)
- Neither cisgender nor transgender describe me because: \_\_\_\_\_
- Unsure because: \_\_\_\_\_

And, which of these categories would you like us to include you in?

- Binary (someone who identifies as exclusively a man/male or woman/female)
- Nonbinary (someone who has an identity other than exclusively woman/female or man/male)
- Neither binary nor nonbinary describe me because: \_\_\_\_\_
- Unsure because: \_\_\_\_\_

What is your sex assigned at birth?

- Male
- Female
- Intersex
- Prefer not to answer

What is your ethnicity?

- Hispanic origin
- Not of Hispanic origin
- Prefer not to answer

What is your race? (check all that apply)

- American Indian or Alaska Native
- Asian
- Black or African American

- Middle Eastern
- Native Hawaiian or Pacific Islander White
- Another race/ethnicity/Describe in your own words: \_\_\_\_\_
- Prefer not to answer

What country do you live in? \_\_\_\_\_

What is your sexual orientation (check all that apply)

- Asexual
- Bisexual
- Gay
- Heterosexual/Straight
- Lesbian
- Pansexual
- Queer
- Questioning
- Another identity/Describe in your own words: \_\_\_\_\_

What is your current estimated household income, including you and all others who contribute?

- Less than \$20,000
- \$20,000 - \$39,999
- \$40,000 - \$59,999
- \$60,000 - \$79,999
- \$80,000 - \$99,999
- More than \$100,000
- Prefer not to answer

What is your current relationship status?

- Single, never married
- Married or partner living in the home
- Partner not living in the home
- Separated
- Divorced
- Widowed
- Prefer not to answer

What is the highest level of education you have completed?

- Less than high school degree
- High school graduate (high school diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree

- Doctoral degree
- Professional degree

### **Child Demographics**

**The following questions will ask you about your child(ren) and household.**

Do you have a child between the ages of 0 and 5 years?

- Yes
- No

Which of these best describes your parenting role?

- Mother
- Father

How many children are currently living in your home in **each** of the age groups below? (*please fill out every box, entering 0 as appropriate*)

- 0-4 yrs.
- 5-7 yrs.
- 8-12 yrs.
- 13-17 yrs.
- 18+ yrs.

**If you only have one child** between the ages of 0 and 5 years, please write a **pseudonym** for your child (not your child's real name) below.

**If you have many children** between the ages of 0 and 5 years, think of the child that you have the *most difficulties parenting*, and please write a **pseudonym** for your child (not your child's real name) below.

**Please answer the following questions about the child that you wrote a pseudonym for in your previous response.**

Was your child adopted

- Yes
- No
- Prefer not to answer

What is your child's assigned sex at birth?

- Male
- Female
- Intersex
- Prefer not to answer

What is your child's ethnicity?

- Hispanic origin
- Not of Hispanic origin
- Prefer not to answer

What is your child's race? (check all that apply)

American Indian or Alaska Native

Asian

Black or African American

Middle Eastern

Native Hawaiian or Pacific Islander White

Another race/ethnicity/Describe in your own words: \_\_\_\_\_

Prefer not to answer

## APPENDIX B

### **Emotional Availability Self-Report (36 items)**

**Please respond to each question or statement as it applies to the child that you provided information for in the previous form (must be a child between the ages of 0 to 5).**

1. *Not agree at all*
2. *Rather not agree*
3. *Neutral*
4. *Rather agree*
5. *Totally agree*

1. I like to have eye-contact with my child.
2. I succeed in adjusting to my child's behaviors and actions when necessary.
3. My child clearly enjoys being together with me.
4. I find it hard to understand the needs of my child.
5. I like to see my child playing or being on his/her own.
6. It happens that I react in an angry way to my child.
7. I'm happy with my child.
8. By using his/her body language, my child is able to show me he/she wants to play, talk, or interact.
9. My child tries to communicate with me.
10. When my child shows difficult or oppositional behavior, I sometimes don't know how to cope with the conflict.
11. Parents always have to present their children new challenges and to show the way.
12. I sometimes use injuring words to my child.
13. I often find my child annoying.
14. When I'm at home together with my child, we interact and talk to each other a lot.

15. It happens that I become agitated or frustrated, when I am with my child.
16. I wonder whether my child enjoys my presence.
17. My child is able to get my attention for his/her play or as he goes about the day.
18. Now and then, my child elicits more anger in me than I would like.
19. My child calls me to come and play, talk, and/or interact.
20. I find it hard to attune myself to the rhythm of interaction with this particular child.
21. I find it hard to structure my child's behaviors and actions when s/he does things that are not allowed and/or are dangerous.
22. I find it hard to see my child playing or being on his own, I prefer to do things together when we're at home.
23. I always want to know what my child is up to or is thinking.
24. It happens that I shout to my child to make myself clear.
25. My child claims my attention.
26. My child cries, whines, moans, and complains a lot to me.
27. My child brings, shows and involves me in his/her interests.
28. My child often asks me to look at what s/he is playing or doing.
29. It happens that I raise my voice to my child.
30. When my child seems sad, worried, or upset, I can usually figure it out.
31. I seem to have a need to control and lead things and have a hard time backing off.
32. My child can easily be involved in playing or as he goes about other activities.
33. My child never asks me to play, talk, or interact.
34. Sometimes, my child brings about angry reactions in me.
35. Parents constantly have to offer their child new challenges.
36. My child often expresses his/her desire to play, talk and/or interact with me.

## APPENDIX C

### **Patient Health Questionnaire – 9 (PHQ-9)**

**Over the last 2 weeks, how often have you been bothered by any of the following problems?**

- (0) Not at all*
- (1) Several days*
- (2) More than half the days*
- (3) Nearly every day*

1. Little interest or pleasure in doing things.
2. Feeling down, depressed, or hopeless.
3. Trouble falling or staying asleep, or sleeping too much.
4. Feeling tired or having little energy.
5. Poor appetite or overeating.
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down.
7. Trouble concentrating on things, such as reading the newspaper or watching television.
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual.
9. Thoughts that you would be better off dead or of hurting yourself in some way

## APPENDIX D

### **The State Trait Anxiety Inventory (STAI)**

A number of statements which people have used to describe themselves are given below. Read each statement and select the appropriate response to indicate how you feel right now, that is, at this very moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

*1. Not at all      2. A little      3. Somewhat      4. Very Much So*

1. I feel calm
2. I feel secure
3. I am tense
4. I feel strained
5. I feel at ease
6. I feel upset
7. I am presently worrying over possible misfortunes
8. I feel satisfied
9. I feel frightened
10. I feel comfortable
11. I feel self-confident
12. I feel nervous
13. I feel jittery
14. I feel indecisive
15. I am relaxed
16. I feel content
17. I am worried
18. I feel confused
19. I feel steady
20. I feel pleasant

A number of statements which people have used to describe themselves are given below. Read each statement and select the appropriate response to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. *Almost never*    2 *Sometimes*    3 *Often*    4 *Almost always*

21. I feel pleasant
22. I feel nervous and restless
23. I feel satisfied with myself
24. I wish I could be as happy as others seem to be
25. I feel like a failure
26. I feel rested
27. I am "calm, cool, and collected"
28. I feel that difficulties are piling up so that I cannot overcome them
29. I worry too much over something that really doesn't matter
30. I am happy
31. I have disturbing thoughts
32. I lack self-confidence
33. I feel secure
34. I make decisions easily
35. I feel inadequate
36. I am content
37. Some unimportant thought runs through my mind and bothers me
38. I take disappointments so keenly that I can't put them out of my mind
39. I am a steady person
40. I get in a state of tension and turmoil as I think over my recent concerns and interests

## APPENDIX E

### **Brief Version of the Big Five Personality Inventory**

**Instructions:** How well do the following statements describe your personality?

I see myself as someone who ...

- (1) Disagree strongly*
- (2) Disagree a little*
- (3) Neither agree nor disagree*
- (4) Agree a little*
- (5) Agree strongly*

1. ... is reserved (E – R)
2. ... is generally trusting (A)
3. ... tends to be lazy (C – R)
4. ... is relaxed, handles stress well (N – R)
5. ... has few artistic interests (O – R)
6. ... is outgoing, sociable (E)
7. ... tends to find fault with others (A – R)
8. ... does a thorough job (C)
9. ... gets nervous easily (N)
10. ... has an active imagination (O)

## APPENDIX F

### **The Survey of Well-being of Young Children (SWYC)**

#### ***Questions for children 0 to 17 month, 31 days***

These questions are about your child's behavior. Think about what you would expect of other children the same age and tell us how much each statement applies to your child.

*0 Not at all      1 Somewhat      2 Very Much*

#### **Baby pediatric symptom checklist**

1. Does your child have a hard time being with new people?
2. Does your child have a hard time in new places?
3. Does your child have a hard time with change?
4. Does your child mind being held by other people?
  
5. Does your child cry a lot?
6. Does your child have a hard time calming down?
7. Is your child fussy or irritable?
8. Is it hard to comfort your child?
  
9. Is it hard to keep your child on a schedule or routine?
10. Is it hard to put your child to sleep?
11. Is it hard to get enough sleep because of your child?
12. Does your child have trouble staying asleep?

#### **Parental Concerns**

13. Do you have any concerns about your child's learning or development?
14. Do you have any concerns about your child's behavior?

#### **Family Questions**

Please answer a few questions about your family below:

*1 Yes    2 No*

15. Does anyone who lives with your child smoke tobacco?
16. In the last year, have you ever drunk alcohol or used drugs more than you meant to?
17. Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?
18. Has a family member's drinking or drug use ever had a bad effect on your child?
  
19. Within the past 12 months, we worried whether our food would run out before we got money to buy more.

1. *Never true*
2. *Sometimes true*
3. *Often true*

20. In general, how would you describe your relationship with your spouse/partner?

1. *No tension*
2. *Some tension*
3. *A lot of tension*
4. *Not applicable*

21. Do you and your partner work out arguments with:

1. *No difficulty*
2. *Some difficulty*
3. *Great difficulty*
4. *Not applicable*

22. During the past week, how many days did you or other family members read to your child?.....1 2 3 4 5 6 7

***Questions for children 18 months to 2 years, 11 months***

These questions are about your child's behavior. Think about what you would expect of other children the same age and tell us how much each statement applies to your child.

*0 Not at all      1 Somewhat      2 Very Much*

Does your child...

1. Seem nervous or afraid?
2. Seem sad or unhappy?
3. Get upset if things are not done in a certain way?
4. Have a hard time with change?
5. Have trouble playing with other children?
6. Break things on purpose?
7. Fight with other children?
8. Have trouble paying attention?
9. Have a hard time calming down?
10. Have trouble staying with one activity?

Is your child...

11. Aggressive?
12. Fidgety or unable to sit still?
13. Angry?

Is it hard to...

14. Take your child out in public?
15. Comfort you child?
16. Know what your child needs?

17. Keep your child on a schedule or routine?

18. Get your child to obey you?

19. Does your child bring things to you to show them to you?

1. *Many times a day*
2. *A few times a day*
3. *A few times a week*
4. *Less than once a week*
5. *Never*

*4 Always 3 Usually 2 Sometimes 1 Rarely 0 Never*

20. Is your child interested in playing with other children?

21. When you say a word or wave your hand, will your child try to copy you?

22. Does your child look at you when you call his or her name?

23. Does your child look if you point to something across the room?

24. How does your child usually show you something he or she wants? (*please select all that apply*)

1. *Says a word for what he or she wants*
2. *Points to it with one finger*
3. *Reaches for it*
4. *Pulls me over or puts my hand on it*
5. *Grunts, cries or screams*

25. What are your child's favorite play activities? (*please select all that apply*)

1. *Playing with dolls or stuffed animals*
2. *Reading books with you*
3. *Climbing, running, and being active*
4. *Lining up toys or other things*
5. *Watching things go round and round like fans or wheels*

*0 Not at all 1 Somewhat 2 Very Much*

26. Do you have any concerns about your child's learning or development?

27. Do you have any concerns about your child's behavior?

Please answer a few questions about your family below:

*2 Yes 2 No*

28. Does anyone who lives with your child smoke tobacco?

- 29. In the last year, have you ever drunk alcohol or used drugs more than you meant to?
- 30. Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?
- 31. Has a family member's drinking or drug use ever had a bad effect on your child?
- 32. Within the past 12 months, we worried whether our food would run out before we got money to buy more.
  - 4. *Never true*
  - 5. *Sometimes true*
  - 6. *Often true*
- 33. In general, how would you describe your relationship with your spouse/partner?
  - 5. *No tension*
  - 6. *Some tension*
  - 7. *A lot of tension*
  - 8. *Not applicable*
- 34. Do you and your partner work out arguments with:
  - 5. *No difficulty*
  - 6. *Some difficulty*
  - 7. *Great difficulty*
  - 8. *Not applicable*
- 35. During the past week, how many days did you or other family members read to your child?.....1 2 3 4 5 6 7

**Questions for children 3 to 5 years**

These questions are about your child's behavior. Think about what you would expect of other children the same age and tell us how much each statement applies to your child.

*0 Not at all      1 Somewhat      2 Very Much*

Does your child...

- 1. Seem nervous or afraid?
- 2. Seem sad or unhappy?
- 3. Get upset if things are not done in a certain way?
- 4. Have a hard time with change?
- 5. Have trouble playing with other children?
- 6. Break things on purpose?
- 7. Fight with other children?
- 8. Have trouble paying attention?
- 9. Have a hard time calming down?
- 10. Have trouble staying with one activity?

Is your child...

- 11. Aggressive?

- 12. Fidgety or unable to sit still?
- 13. Angry?

Is it hard to...

- 14. Take your child out in public?
- 15. Comfort your child?
- 16. Know what your child needs?
- 17. Keep your child on a schedule or routine?
- 18. Get your child to obey you?

*0 Not at all      1 Somewhat      2 Very Much*

- 19. Do you have any concerns about your child's learning or development?
- 20. Do you have any concerns about your child's behavior?

Please answer a few questions about your family below:

*1 Yes   2 No*

- 21. Does anyone who lives with your child smoke tobacco?
- 22. In the last year, have you ever drunk alcohol or used drugs more than you meant to?
- 23. Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?
- 24. Has a family member's drinking or drug use ever had a bad effect on your child?

25. Within the past 12 months, we worried whether our food would run out before we got money to buy more.

- 7. Never true*
- 8. Sometimes true*
- 9. Often true*

26. In general, how would you describe your relationship with your spouse/partner?

- 9. No tension*
- 10. Some tension*
- 11. A lot of tension*
- 12. Not applicable*

27. Do you and your partner work out arguments with:

- 9. No difficulty*
- 10. Some difficulty*
- 11. Great difficulty*
- 12. Not applicable*

28. During the past week, how many days did you or other family members read to your child?.....*1 2 3 4 5 6 7*

## APPENDIX G

### **Emotional Availability—Self-Report short form (13 item)**

1. *Not agree at all*
  2. *Rather not agree*
  3. *Neutral*
  4. *Rather agree*
  5. *Totally agree*
- 
1. My child clearly enjoys being together with me.
  2. It happens that I react in an angry way to my child.
  3. I'm happy with my child.
  4. My child tries to communicate with me.
  5. I sometimes use injuring words to my child.
  6. I often find my child annoying.
  7. It happens that I become agitated or frustrated, when I am with my child.
  8. Now and then, my child elicits more anger in me than I would like.
  9. My child calls me to come and play, talk, and/or interact.
  10. I find it hard to attune myself to the rhythm of interaction with this particular child.
  11. My child brings, shows and involves me in their interests.
  12. My child never asks me to play, talk, or interact.
  13. Sometimes, my child brings about angry reactions in me.