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Parent Stress and Observed Parenting in a Parent-Child Interaction Task in a Predominantly Minority and Low-Income Sample

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Abstract

High stress in parents may affect parenting and subsequent child socioemotional and behavioral development. Previous evidence suggests that highly stressed parents are more likely to engage in negative parenting, which is less structured and more punitive. However, the effects of life stress versus parent specific stress on parent-child interactions in early childhood has not been well studied, especially in minority and low-income samples. Thus, the current study assessed the relationship between perceived life stress, parenting-related stress, and observed parenting responses to young children during a structured, mildly challenging parent-child task.

Predominantly minority and low-income parents and their children (2-5 years old; 54 dyads) completed the Perceived Stress Scale, the Parenting Stress Inventory, and participated in a structured 5-minute interaction task, the Toy-Wait Task (TWT), that was video-taped and coded by blind raters. The coding utilized a standardized system with good reliability assessing 1) Affect (parent and child positive and negative affect, shared positive affect), 2) Positive Parenting Behaviors (warmth, structured good involvement, listening/engagement), and 3) Negative Parenting Behaviors (reactivity, judgment, critical parenting). Significant associations were found between perceived life stress and parenting stress, ($r(54) = 0.61, p < .01$). Parents with higher perceived life stress scores showed more negative affect ($r = 0.291, p < .05$) and lower involvement with the child ($r = -0.367, p < .05$), while parenting specific stress did not yield significant effects (p 's > 0.05). Findings suggest that interventions that reduce stress in minority and low-income parents of young children may also improve parenting of young children with potential impact on decreasing child psychopathology risk.

Keywords

Stress; Parents; Parenting Behavior; Structured Interaction Task

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Introduction

Parents today are facing a multitude of stressors that may impact their parenting style and behaviors [1-3]. Stress comes from a variety of sources, such as finances, work, family caretaking [4] and relationship pressures [5-7]. In addition to external sources of stress, parents internally struggle with emotional and practical management of multiple demands and partitioning time between parenting and their own needs [8,9]. Parents' behaviors and interaction with children may be shaped and influenced because of these stressors [10], impacting children's early socioemotional, behavioral, and academic development [1, 11-13]. This is further compounded amongst minority and low-income families that in turn further increases risk of poor health outcomes [14-16]. For example, poor emotional self-regulation taught through caregiver-child interactions [17,18] may have downstream effects on children's socioemotional development [19, 20] and on childhood obesity risk [14,16]. Promotion of positive parenting behaviors at an early age could help prevent socioemotional developmental issues [21]. Given the strong link between parenting behaviors and child development, it is critical to examine the role of stress in parent-child interactions in urban low-income families. Additionally, it is still unclear as to whether the impact of stress on parenting behaviors comes from the unique demands of being a parent or from high life stress and burden.

Parents also face stress unique to parenting, which can be defined as the response to the demands of parenthood and perception of available resources to help the parent cope [22]. To date, little work has been done to separate out the effects of parent's general life stress compared to specific parenting stress and their relationship to one another. Making this distinction and understanding the relationship between the two is important, as this may illuminate distinct pathways to improving parent-child interactions. Positive parental interactions include engaging and listening to their young children, reinforcing positive behaviors, and expressing and modeling positive affect, which is known to increase child positive affect, support positive language and behavioral development [23,24]. Harsh and negative parenting behaviors have been associated with more depressive symptoms in children [25], more externalizing and internalizing problems during childhood [26,27], and altered brain development in adolescence [28]. Parenting stress is significantly correlated with parenting practices and previous studies have found that the more specific parenting related stress parents experience, the more negative parenting styles they take on [29-31]. While there is some previous work to support the notion that increased perceived life stress is associated with less optimal parenting [32], and reduced perceived life stress can increase positive parenting, direct observational assessment of these processes has been rare [33]. Rather, past literature has commonly found associations between parenting specific stress, measured through the PSI, and negative parenting behaviors [34,35,31]. Studies that have examined the interaction between perceived life stress, parenting stress, and observed behavioral parent responses in a controlled laboratory setting in predominantly minority and low-income samples are rare.

Several models explain how perceived life stress and specific parenting stress may influence parenting behaviors. In the Process Model of determinants of parenting [36], psychological well-being, child characteristics, and contextual sources of stress and support are major

determinants that influence parenting behaviors. In the Parental Stress Model [37], parenting stress, resulting from perceived external stressors or demands relating to the parenting role, are critical determinants of parenting practices, specifically dysfunctional parenting. Parents with high parenting specific stress are more likely to engage in negative parenting, which includes critical parenting, less warm and responsive parenting, and more punitive parenting [38,39]. Additionally, both parenting specific stress and general perceived life stress can increase harsh discipline parenting styles [40,41]. Importantly, these current theories and findings focus more on parenting stress and the role of perceived life stress while their effects on parenting behaviors remains unclear.

Thus, the current study examined the relationship between perceived parent life stress, parenting stress, and observed parent-child interactions during the Toy Wait Task (TWT), a structured, mildly challenging parent-child task that has been used to measure child and parent emotion and parenting behaviors [42,19]. We hypothesized that higher perceived parent life stress, measured with the Perceived Stress Scale (PSS), will be associated with higher parenting stress, measured with the Parenting Stress Inventory (PSI) [43,44]. Additionally, we hypothesized that both high perceived parent life stress and high parenting stress will be associated with less optimal observed behavioral parenting responses in the Toy Wait Task, manifested by increased negative parenting behaviors (including reactivity, judgement, and critical parenting), decreased positive parenting behaviors (including warm and supportive parenting, lower good structured involvement and listening and engagement), and with higher parent negative affect. Finally, we anticipated that positive and negative parenting behaviors would be inversely related to one another.

Methods

Parents and their young children (2-5 years old; 54 parent-child dyads) were recruited from a mid-size New England urban area and surrounding local communities between August 2014 and February 2015. Mothers comprised most of the sample (98%, 32.4 ± 6.6 years old). The sample was predominately non-white (64.8%), and low income (70.4% income level < \$45,000). Parents with a young child aged 2-5 years old and reporting experiencing stress in their lives were enrolled. Individuals who self-reported current medical or psychiatric illness that required acute medical care or pharmacologic intervention, as well as acute psychiatric symptoms, were excluded. Individuals were also excluded if the target child was diagnosed with a pervasive developmental or mental disorder. Additionally, individuals with current untreated substance use disorder, based on self-report of current drug use or positive urine toxicology, were excluded. The study was approved and performed in compliance with the Human Investigation Committee (Institutional Review Board) and listed in [Clinicaltrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT01974102) (NCT#01974102).

Procedures

Predominantly minority and low-income families were enrolled for a research project on stress, nutrition, and healthy lifestyles for parents were overweight or obese. Potential participants were screened by phone to ensure they met initial eligibility criteria. After obtaining participants' informed consent, participants then completed 2-3

intake appointments. These appointments included several questionnaires on demographic information, perceived life stress (Perceived Stress Scale, PSS; [44]), and parenting-related stress (Parenting Stress Index, PSI; [43]). Parent-child dyads then completed the Toy Wait Task [19].

Measures

PSS—The Perceived Stress Scale (PSS; [44]) was used to assess life stress (parents' subjective perceived stress levels). The PSS is a 14-item self-report scale with excellent test-retest reliability and good construct validity [44]. It evaluates the extent to which individuals view situations in their lives as stressful (scores ranging from 0-40), with higher scores indicating more perceived life stress. In the current study, the Cronbach's Alpha for the PSS was $\alpha = .80$.

PSI—Parents completed the Parenting Stress Index Short Form (PSI; [43,45]) to assess parenting stress (stress unique to parenting). This 36-item self-report questionnaire has good internal consistency and validity. It assesses both overall parenting stress and the parent-child relationship, parenting-related relationship challenges with their spouse/partner, feelings of social isolation or incompetence/guilt, and life restrictions from being a parent. For each item, participants either indicate the degree to which they agree with the statement on a five-point scale or select the appropriate response from the options provided. Higher total PSI scores indicate more parenting stress. In our sample, the Cronbach's Alpha for the PSI was $\alpha = .92$.

Toy Wait Task (TWT)—Parent and child dyads participated in a mildly emotionally challenging 5-minute task, the Toy-Wait Task (TWT, based on [19]) that was video-taped and later coded by trained raters. Parent-child dyads were brought into the TWT laboratory room, where a video camera was set up on top of a tall cabinet. The parent completed some baseline assessments and then the parent and child were given task instructions. The research assistant (RA) showed the child an attractive new toy, which was then taken away and put on top of the cabinet just out of the child's reach. The child was given a broken toy to play with instead. The parent was asked to explain to the child that he or she had to wait 5 minutes for the new toy and could have it only after the parent completed some work. If the child asked for the new toy, the parent was asked to "remind them that there is another toy to play with." Following these instructions, the RA left the room for 5 minutes. At the end of the task, the RA returned to the room and gave the child the new toy.

The TWT is widely used to assess observed parenting and emotions in preschool-aged children [42,46,19,47]. The TWT sessions were video-taped and coded by raters who were trained on a standardized coding system (based on [46] and on [48]). An established coding system [46,49] provided guidance to rate the parent and child positive affect expressions (e.g., smiling, laughing) and negative affect expressions (e.g., jaw clenched, brow furrowed, harsh tone). For parenting, coders also rated three positive parenting codes and three negative parenting codes, based on the mindful parenting literature [50,49,51]. Coders rated each affect or parenting code on a scale from 1-5 ("none present" to "high level"), based on facial expressions, behaviors, vocal tone, and speech content across the entire

5-minute period. A high level would indicate the behavior is intense and is present in most of the interaction. This coding system has shown good reliability (ICC=.70, K=.89-.91) in our previous work [46, 52]. For this study, twenty percent of the videotaped TWTs were randomly chosen, double-coded, and checked for inter-rater reliability.

Positive Parenting Codes.: The three positive parenting codes were warmth, involvement, and listening/engagement. Parents were coded highly on warmth if they showed interest in the child's activities, showed verbal and non-verbal acknowledgement of their accomplishments when the child actively engaged with the toy, and provided physical comfort and soothing. Parents were coded highly on involvement if they set limits, helped the child plan activities during the 5 minutes, such as playing with the broken toy, and explained the rules to the child. Parents were coded highly on listening and engagement if they appeared present in the moment, such as making eye contact with the child and paraphrasing what the child said.

Negative Parenting Codes.: The three negative parenting codes were judgement of child, reactivity, and critical parenting. Parents were coded highly on judgement of child if they made statements about a child's trait or behavior as bad or used "should" or used absolutist terms (like "never", "always," etc.). Parents were coded highly on reactivity if they responded harshly to the child, interrupted the child, or overreacted to the child's behavior. Parents were coded highly on critical parenting if they criticized or mocked the child, such as putting down the child or making fun of the child harshly.

Data Analysis

Data analysis was conducted in R [53]. Pearson product moment correlations were conducted to test the proposed hypotheses regarding perceived stress associations with parenting stress. Given the non-normal distributions of the parenting and affect subscales, Spearman correlations were conducted for hypotheses relating to these variables. Missing data was omitted in a pairwise fashion so as not to penalize a participant for simply missing a measure. To better parse unique facets of parent and child behaviors, individual subscales were used in the analyses.

Results

Demographic data for parents and children, including age, race, and parent education level, were gathered with parent report forms (Table 1). 54 parent-child dyads were included in the results. The sample included a diverse group of parents, 32.4 ± 6.6 years old, predominantly non-white (64.8%), and low income (70.4% income level < \$45,000). Their children were of preschool age (45.3 ± 13.7 months, 53.7% female).

Positive Relationship Between Perceived Life Stress and Parenting Stress

There was a significant strong positive relationship between perceived life stress and parenting stress ($r=0.614$, $p<.01$; (Figure 1)).

Life Stress and Parenting Stress Significantly Relate to Observed Parenting Behavior in the TWT

Higher perceived life stress was significantly correlated with higher parent negative affect in the TWT ($r=0.291$, $p<.05$; (Figure 2)). Higher perceived life stress was also significantly correlated with decreased structured parental involvement in the TWT ($r=-0.367$, $p<.05$). No significant effects were found between parenting stress (stress specific to parenting) and parent or child affect or parenting behaviors in the TWT ($p's > 0.05$; Table 2).

Positive and Negative Parenting Behaviors

Many, although not all, positive parenting subscales were correlated to each other. Most notably, listening & engagement was associated with all positive parenting subscales ($r's$ 0.32- 0.54, $p's < 0.05$). Parent negative affect was significantly positively associated with all negative parenting subscales ($r's$ 0.33-0.69, $p's < 0.05$). In addition, as shown in Figure 3, some positive and negative subscales negatively correlated with one another. For instance, while child negative affect did not correlate with negative parenting subscales, it did negatively correlate with both positive parent and child affect ($r's$ -0.32 and -0.35 , respectively) (all significant correlations shown in (Figure 3)).

Discussion

In line with our first hypothesis, perceived life stress and parenting stress were significantly correlated in the predominantly minority and low-income sample. While perhaps intuitive, prior studies have not directly examined this relationship, especially in minority and low-income families. Our result suggests that high levels of perceived life stress are a significant contributor to parenting stress and impact observed parenting behaviors by increasing the risk of greater negative affect and decreasing positive parenting behaviors in early childhood. These results align with previous research on parent stress and child development [39,54].

We found that greater perceived life stress was associated with more negative affect during the child interaction task, as well as lower parent structured involvement. This is congruent with previous findings that parents with high levels of stress may be less affectionate towards their children and engage in less responsive parenting, such as limiting and labeling children's play [55]. One explanation is that highly stressed parents have fewer resources and limited time and energy for tasks of parenthood [56,57]. The relationship of perceived life stress to increased parent negative affect has important implications as parent negative affect towards their child may further perpetuate negative affect in the child's life, particularly in those who face more financial and social adversity [58] and impact children's cognitive and social- emotional development [57]. These significant findings were perceived life stress specific, as we did not find associations between parenting stress and negative parenting behaviors during the TWT. This differs from some prior research that links specific parenting stress to negative affect and negative parenting styles [29,59-61]. Although it is not possible to say with certainty from our cross-sectional dataset, it could be that while perceived life stress makes a parent more affectively reactive in the moment

to a child's distress, parenting stress works longitudinally along trait anxiety and depressive symptomatology pathways [62,63].

In alignment with our final hypothesis, we found that several positive parenting behaviors were correlated with one another. Negative parenting behaviors were also correlated with one another and were inversely correlated with some positive parenting behaviors. Parent negative affect was positively correlated with all negative parenting behaviors, highlighting the relevance of parent affect in interacting with their children as observed in the parent-child task. Conversely, parent positive affect did not show this inverse relationship with all negative parenting subscales. Future work may benefit from exploring the role and scope of negative versus positive parent attitudes and behaviors toward the child and its potential impact on child development. While negative affect was a dominant component among the negative subscales, listening & engagement was positively correlated with all other positive parenting behaviors. This may indicate that listening and engaging is a component of the other scales, i.e. a parent cannot help the child plan their activities (structured involvement) without also engaging with the child. Additionally, listening and appropriately responding to the child may improve parent-child interactions and reduce conflict [64]. However, notably, perceived life stress was not correlated with listening and engagement, suggesting that parents with high perceived stress may still listen and attend to their young children, even if not demonstrating involvement with them in facing challenging tasks [37, 36, 22].

Strengths, Limitations, and Future Directions

This study had many strengths, including a predominantly minority and socioeconomically disadvantaged sample, creative multi-method design involving an acute laboratory challenge to assess parent-child interactions, and careful measurement of life and parenting stress. There were a few limitations as well. First, our parent sample predominantly consisted of mothers. Future work would benefit from exploring the impact of fathers' life stress and parenting stress on parent-child interaction, as there have been documented differences in men and women's perceived life stress levels [65,66]. Second, as the participants were enrolled in a subsequent intervention after participation in the TWT, our sample specifically included parents with BMIs in the overweight and obesity range [67]. As obesity is a chronic condition that may bring its own set of stressors, future research would benefit from enrolling those with a full spectrum of BMI to assess life stress, parenting stress, and parenting behaviors. Finally, due to the cross-sectional nature of our design we cannot disentangle the bidirectional relationship between parent stress and parent-child interactions, as they both can potentially affect one another.

Conclusion

Perceived life stress and parenting stress are highly correlated to one another, but perceived life stress is uniquely related to negative parent affect and inversely to structured involvement in parenting. Furthermore, while negative and positive parenting styles significantly correlated with each other, negative parent affect, structured good involvement, and listening and engaging were the most consistently interrelated to the other subscales. Taken together, our findings suggest that interventions to reduce parent stress such as our

previous pilot study that utilized a mindfulness-based intervention may positively influence parent-child interactions and parenting behaviors to improve child health outcomes [67]. Such interventions could aim to reduce sources of parent stress through social programs or help parents with socioemotional coping skills, such as mindful awareness and parental self-regulation, that help build optimal parenting skills. Future work may also benefit from measuring parenting behavior in a real-world context in contrast to our in-laboratory design.

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Abbreviations:

TWT	Toy Wait Task
PSI	Parenting Stress Inventory
PSS	Perceived Stress Scale
RA	Research Assistant
BMI	Body Mass Index (BMI)

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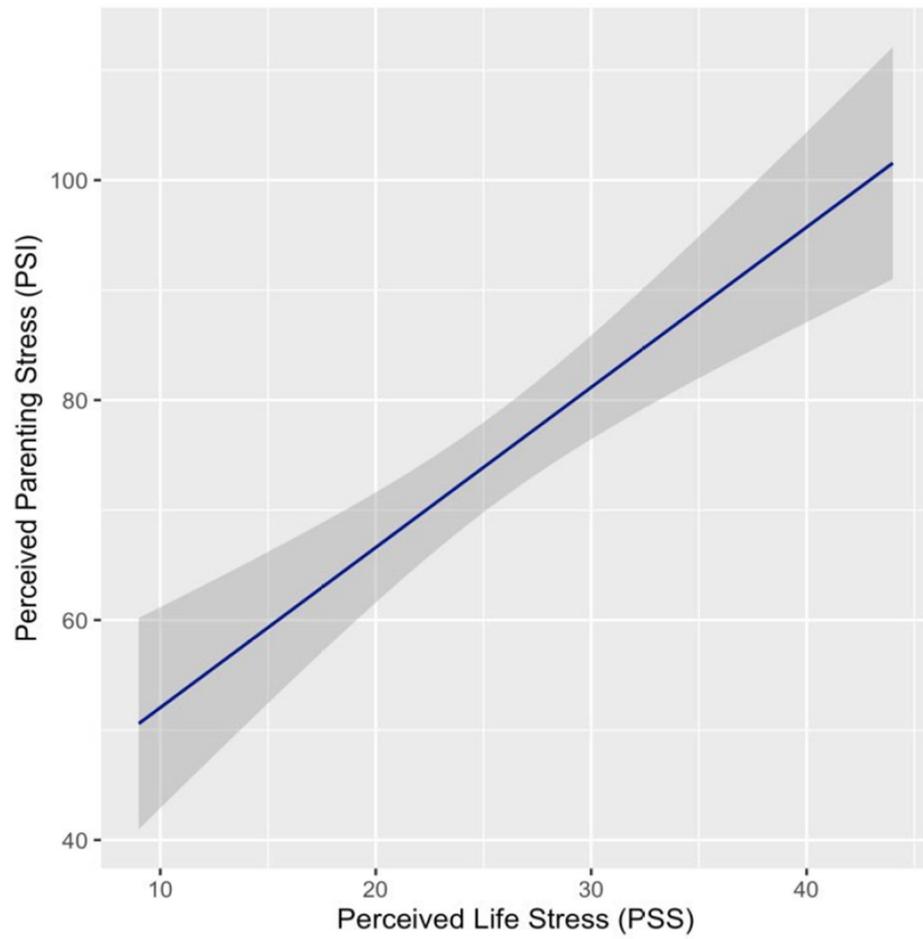


Figure 1: Positive Correlation between Perceived Stress and Parenting Stress ($r=0.614$, $p<.01$).

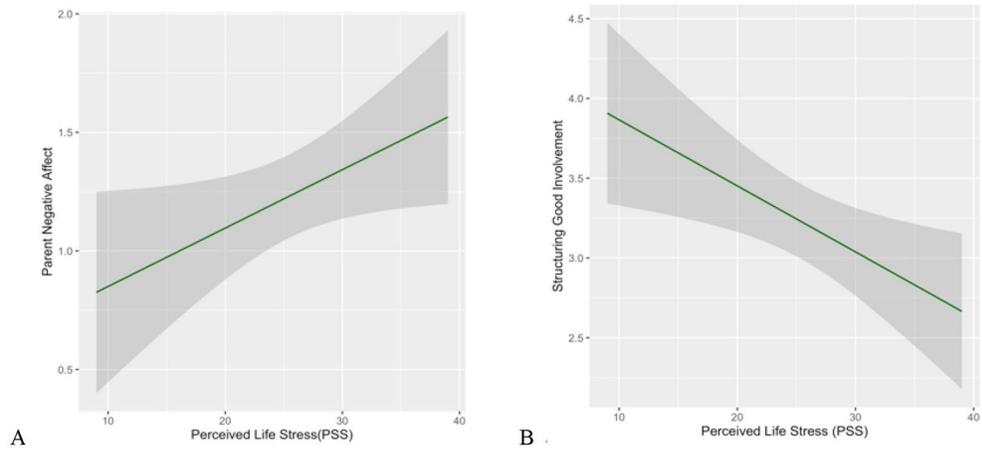


Figure 2:
Life Stress Relationships to Parent Negative Affect and Structured Good Involvement.
A: Perceived Stress Scale is positively associated with Parent Negative Affect subscale ($r=0.291$, $p<.05$) **B:** Perceived Stress Scale is negatively associated with Structured Good Involvement subscale ($r=-0.367$, $p<.05$)

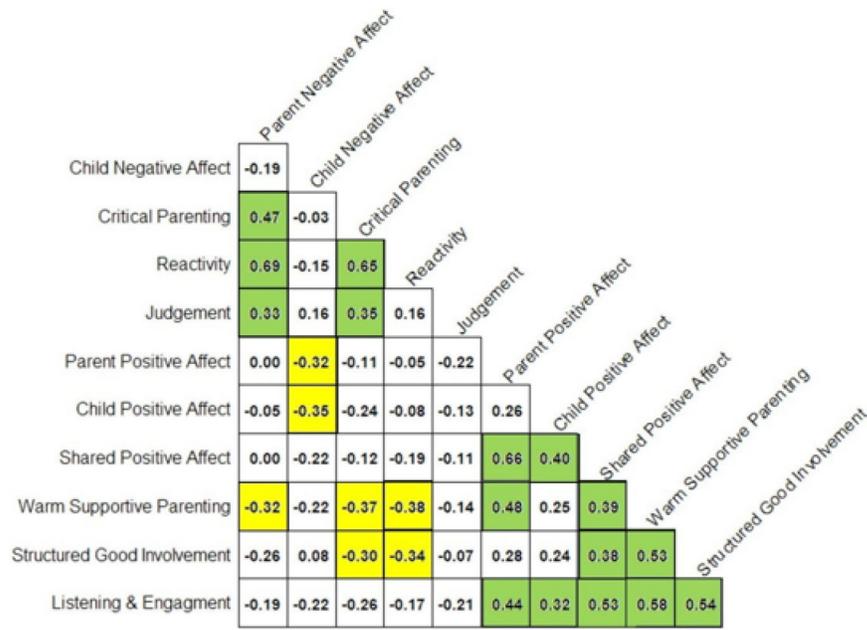


Figure 3: Spearman correlation matrix of significance for parenting behaviors. Green indicates positive significant correlation ($p < 0.05$) and yellow indicates negative significant correlation ($p < 0.05$).

Table 1:

Demographics for parent-child dyads and parent stress measures in the total sample; N varies between 51-54 per availability of data for each measure, standard deviation are in the parenthesis; Categorical variables are notated as N[%], continuous variables are noted as mean (SD).

	N		54 dyads
Parents	Age (years)		32.4 (6.6)
	Sex	Female	53 [98]
	Race	White	19 [35.2]
		Non-white	35 [64.8]
	Education (years)		13.8 (2.3)
	Weight (lbs.)		213.4 (53.9)
	Body Mass Index (kg/m ²)		36.1 (8.3)
	Income	below \$45,000	38 [70.4]
\$45,000 or above		16 [29.6]	
Children	Age (months)		45.3 [13.7]
	Sex	Female	28 [53.7]
	Race	White	18 [33.3]
		Non-white	36 [66.7]
Parent Stress	Perceived Stress Scale (PSS)		25.8 (8.1)
	Parenting Stress Index (PSI)		74.6 (18.59)

Table 2:

Spearman Correlation between Parent Stress, Parenting Stress, and Parenting Behavior and Affect during TWT; *Correlation is significant at the 0.05 level (2-tailed).

	PSS	PSI
Parent Negative Affect	0.291*	0.203
Parent Positive Affect	-0.089	-0.092
Shared Positive Affect	-0.202	-0.197
Warm Supportive Parenting	-0.040	-0.097
Structured Good Involvement	-0.367*	-0.154
Listening and Engagement	-0.235	-0.172
Critical Parenting	0.283	0.196
Reactivity	0.158	0.167
Judgment	0.129	0.048