

ABSTRACT

AHERN, LISA SENATORE. Psychometric Properties of the Parenting Stress Index – Short Form. (Under the direction of Mary Haskett.)

Psychometric properties of the Parenting Stress Index – Short Form were investigated using a heterogeneous sample of 185 mothers and fathers of children between the ages of 4-10 years. The Difficult Child and Parent Distress subscales, as well as Total PSI-SF, were found to be internally consistent. Confirmatory factor analysis did not reveal support for a three-factor model. Results were mixed in terms of support for convergent and discriminant validity. The PSI-SF Total and subscales were related to measures of parent psychopathology and perceptions of child adjustment, but not to observed parent and child behavior.

Implications of these findings and suggestions for future research are discussed.

PSYCHOMETRIC PROPERTIES OF
THE PARENTING STRESS INDEX – SHORT FORM

by

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A thesis submitted to the Graduate Faculty of
North Carolina State University in partial fulfillment of the
requirements for the Degree of Master of Science

DEPARTMENT OF PSYCHOLOGY
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

Raleigh

2004

APPROVED BY:

Chair of Advisory Committee

DEDICATION

To my parents, Mary Grace and John Senatore, who always taught me that I could be anything I wanted to be and do anything I set my mind to, and to my husband, David, whose love and support made this paper possible.

BIOGRAPHY

Lisa Ann Senatore Ahern was born November 4, 1978 in Edison, NJ. She is the daughter of John and Mary Grace Senatore and the sister of Michael Senatore. She received her elementary and secondary education in Mt. Laurel and Medford, NJ, graduating from Lenape High School in 1996.

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ACKNOWLEDGEMENTS

I would like to thank my graduate advisor, Mary Haskett, for her support and guidance throughout this learning process. Her time and knowledge have been invaluable. I would like to thank Bill Erchul and Ann Schulte for their time and feedback. Thanks also to Dan Bauer, whose statistical knowledge and guidance made my data analyses possible. A special thanks to the family studies research team, especially Caryn Sabourin Ward, whose patience, positive reinforcement, and support helped me to complete this project.

I am eternally grateful to my parents, who always loved and believed in me and provided me with as many opportunities as they could to ensure my success in life. I am grateful to my brother, Mike, for always loving and supporting me. Thanks also to my family: Betty and Patsy Senatore, Charles and Geraldine Strauss, Kay Moritz and Joe Tverdak, Gemma and Sam Senatore, and Gladys and John Zawilinski, all of whom read to me as a child, provided love and support, and cheered me on throughout my educational career. Thanks to my in-laws, Pauline, Dennis, Sara, and Peter, who have made me a part of their family. Finally, a very special thanks to my husband David, whose patience, love, support, and thoughtfulness make it possible for me to continue my graduate career.

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CHAPTER ONE

Introduction

Because parenting can influence children's social, emotional, and academic adjustment, efforts have been made to determine variables that affect parenting behavior. One such variable is parenting stress. Parenting stress can be defined as excess anxiety and tension specifically related to the role of a parent and to parent-child interactions (Abidin, 1995). Parents' perceptions of their child's behavior, the availability of resources to assist them in parenting, and their feelings of competence regarding their parenting are all important elements of this definition (Deater-Deckard & Scarr, 1996). High parenting stress has been found to be related to a less cooperative, more insensitive, and more intrusive parenting style (Pianta & Egeland, 1990). Stress also can increase the likelihood that some parents may become more critical, punitive, and irritable, which may increase the chance that children will develop conduct problems (Webster-Stratton, 1990). Increased parenting stress also has been associated with a lack of positive parenting behavior. For example, mothers who experienced increased stress were less likely than parents who experienced less stress to promote their children's use of prosocial skills when dealing with their peers (Bhavnagri, 1999). Parenting stress in combination with other factors such as low social support (Chan, 1994) and anger expression (Rodriguez & Green, 1997) has been found to contribute to more extreme parenting problems such as child abuse and elevated child abuse potential. This is of significance because child abuse also is a contributing factor to child social maladjustment including peer rejection, increased aggressive behavior, and decreased social competence (e.g., Bolger & Patterson, 2001; Rogosch & Cicchetti, 1994).

Given that parenting stress has been shown to play an important role in the quality of parenting that mothers and fathers provide and, indirectly, the subsequent development of social behavior in children, it is important that researchers and clinicians have valid and reliable instruments to measure parenting stress. Without established validity and reliability of these measures, the conclusions researchers draw about parenting stress theories and the decisions clinicians make that affect families may be called into question. There are many ways to measure parenting stress, including self-report and direct observation of parenting behavior. Self-report measures are popular methods of measuring parenting stress because they tend to be inexpensive and the least time-consuming method of measurement. One such self-report instrument is the Parenting Stress Index (PSI; Abidin, 1995). The PSI has been validated across many different samples including parents with a range of income and education levels and parents of children with a broad range of ability levels.

Although the PSI has been shown to have strong psychometric properties (Abidin, 1995; Hutcheson & Black, 1996), at 120 items, the length of the PSI can be a burden to researchers, clinicians, and participants/patients, especially when more than one construct is being studied and other questionnaires must be administered. Therefore, Abidin developed the Parenting Stress Index – Short Form (PSI-SF), which has only 36 items. The items comprise three subscales: Parent Distress, Difficult Child, and Parent-Child Dysfunctional Interaction. The Parent Distress subscale measures distress parents feel about their parenting role in light of other personal stresses. The Difficult Child subscale represents behaviors that children often engage in that may make parenting easier or more difficult. Finally, the Parent-Child Dysfunctional Interaction subscale focuses on the degree to which the child is

reinforcing to the parent and the degree to which the child meets the parent's expectations. The PSI-SF is used quite often in research as a measure of parenting stress (e.g., Bhavnagri, 1999; Cowen, 1999; Douglas, 2000; Kelley, 1998; Miller, Cate, & Johann-Murphy, 2001). However, the validity and reliability of the PSI-SF had only been examined in studies that employed restricted samples (i.e., low-income mothers of young children). In fact, a literature review conducted by this author revealed that only two studies have been completed specifically to examine the psychometric properties of the PSI-SF (Deater-Deckard & Scarr, 1996; Reitman, Currier, & Stickle, 2002). In general, research suggests that the PSI-SF holds some promise as a parenting stress scale in terms of reliability and validity, but studies to date are characterized by several limitations.

Limitations of previous psychometric studies of the PSI-SF and other studies using the PSI-SF include small sample sizes, lack of variability in terms of demographic characteristics of participants, and reliance on parent-report measurement tools for all constructs. Researchers have neglected other data collection methods such as direct observation of parent-child interaction. In the present study, the factor structure of the PSI-SF was examined through confirmatory factor analysis. Also, the validity of each sub-scale was evaluated using direct observation of parent child interactions, parent perceptions of child behavior, and parents' reports of their own emotional health. These analyses were based on a heterogeneous sample of parents. Thus, in the present study an attempt was made to use more stringent statistical methods than were used in most previous studies and to improve the generalizability of the research findings regarding the validity of the PSI-SF.

CHAPTER TWO

General Overview

This review includes: (a) a review of relevant models of parenting stress; (b) a description of the influence of parenting stress on parenting behavior and, in turn, the influence of parenting on child social adjustment; (c) a brief review of prior attempts to validate the PSI; and (d) a detailed review of the use of the PSI-SF in parenting research and examinations of the psychometric properties of the PSI-SF.

Models of Parenting Behavior: Sources of Parenting Stress

In order to understand the pivotal role of parenting stress on parenting behavior and its importance in research and clinical practice, models of parenting stress and parenting behavior must be examined. Richard Abidin, the developer of the PSI and PSI-SF created his most recent model based on three previous models of the determinants of parenting behavior: Patterson's (1990) behavioral model, Belsky's (1984) process model of determinants of parenting, and Abidin's (1982) own initial model of parenting stress (Abidin, 1992).

Patterson's behavioral model accounts for the quality of the interactions between a parent and child, and the process by which the quality of those interactions may lead to aggressive and antisocial behavior in children. According to the model, if parents react inappropriately to children's behavior during conflicts, their children will behave more antagonistically. This antagonistic behavior may elicit even more inappropriate reactions from parents, and the conflicts will continue to escalate (Patterson, 1990). It has been suggested that stress may contribute to these disrupted parenting practices and to dysfunctional family management (Patterson, DeBaryshe, & Ramsey, 1989). Although many

studies have supported this model (e.g., Dishion, Patterson, & Kavanagh, 1992; Eddy, Leve, & Fagot, 2001), the model does not specifically explain why parents might react inappropriately to initiate a coercive interaction (Abidin, 1992). In order to explain this dysfunctional parenting behavior, Abidin's model (1992) takes into account the effects of child characteristics on parenting stress.

A second model (Belsky, 1986) that served to inform Abidin's latest parenting stress model is an attempt to outline the global sociological determinants of parenting behavior. According to Belsky (1984), there are three domains of parenting determinants: personal psychological resources of the parent, characteristics of the child, and contextual sources of stress and support. Research on Belsky's model has shown that variables unique to the parent, such as personality characteristics, are important determinants of parenting behavior (Belsky, Lerner, & Spanier, 1988), and those individual characteristics may contribute indirectly to stress and the way parents cope with stress (Belsky, 1984). Aspects of this model have been supported in a variety of studies (e.g., Gallagher, 2002; Phelps, Belsky, & Crnic, 1998), and others have attempted to add to this model (Foss, 1996). Belsky's model takes a broader stance than does Patterson's model in terms of incorporating variables that affect parenting behavior.

In his original model of parenting stress, Abidin (1982) posited that stress may lead to dysfunctional parenting, and, in essence, may be the explanation for parents' inappropriate responses in conflicts with their children. Research on this original model showed that stress and dysfunctional parenting were not linearly related, and low levels of stress also could be detrimental to parenting due to disengagement on the part of the parents (Abidin, 1982).

Although this model describes the role of varying levels of stress in parenting behavior, there are other variables that, as Belsky noted, can also affect parenting. A combination of these variables, their relationship to parenting stress, and the role of parent-child interactions built the framework for Abidin's most recent model.

Abidin's (1992) current model represents an attempt to integrate the many variables that determine parenting behavior across several domains, including behavioral, sociological, environmental, and personality variables. In Abidin's model, many variables contribute to parenting stress and, in turn, parenting behavior. These variables include parents' own personality characteristics and their children's characteristics, as well as the characteristics of the environments in which they live and work. Other variables that may contribute to parenting stress include daily hassles parents encounter, characteristics of their marital relationships, and the occurrence of major life events. All of these variables, according to Abidin's (1992) model, influence parents' cognitions about parenting situations, and those cognitions influence stress level. The parents' appraisals of themselves in a parenting role are key to determining the level of parenting stress a person experiences. The appraisals may be goals for themselves as parents and expectations of others or expectations of their children that are internalized from past experiences (Abidin, 1992). Once a parent appraises the situation and feels stressed, the link between the stress and actual parenting behavior is partially moderated by a variety of resources and supports they may draw upon. This model of parenting stress is reflected in the subscales of the PSI-SF. The Parent Distress subscales addresses parents' feelings of stress in their general lives and stress in their lives since they have had their children. The Difficult Child subscale addresses child characteristics that may

be contributing to parenting stress, and the Parent-Child Dysfunctional Interaction subscale addresses parents' beliefs about whether their children meet their expectations. Testing these complex models of parenting behavior demands valid measures of parenting stress.

Importance of Studying Parenting Stress

One reason it is important to study parenting stress is that stress can adversely affect parenting behavior. Several studies have shown a link between parenting stress and the potential for child maltreatment, an extreme variation of maladaptive parenting behavior (e.g., Crouch & Behl, 2001; Holden & Banez, 1996; Rodriguez & Green, 1997).

Subsequently, it has also been established that harsh parenting can have adverse affects on children's adjustment in terms of children's peer relations, compliance with adults, work habits, and emotional wellbeing manifested at school (Vandell, Posner, & Lee, 1998). Child maltreatment in particular has been found to be related to poor social competence, peer rejection, and externalizing behavior problems (e.g., Rogosch & Cicchetti, 1994). If parenting stress affects parenting behavior and, directly or indirectly, child behavior in a negative way (Webster-Stratton, 1990), understanding stress and parenting behavior and developing interventions for parents should, in turn, improve children's functioning. In efforts to study these constructs and to develop interventions, scales such as Abidin's PSI and PSI-SF are typically used to measure parenting stress. The first step to understanding parenting stress as a construct is to have valid and reliable measures; thus, the present study focused on the reliability and validity of one particular measure - the PSI-SF.

Psychometric Properties of the PSI – SF

Because the PSI-SF is a direct derivative of Abidin's PSI, it has been assumed that the two should be similarly reliable and valid. The original PSI has been evaluated and found to be valid and reliable over time in a variety of samples (e.g., Abidin, 1995; Hutcheson & Black, 1996) and in translated versions (e.g., Oestberg, Hagekull, & Wettergren, 1997; Solis & Abidin, 1991). It is one of the most widely used measures of parenting stress in psychological research. A PsycINFO™ computer literature database search conducted by this author in January of 2004 revealed the use of the PSI in 168 journal articles between the years 1983 and 2003. The PSI is often used to validate other instruments related to stress and parenting (e.g., Berry & Jones, 1995; Kazak, Penati, Waibel, & Blackall, 1996; Streisand, Braniecki, Tercyak, & Kazak, 2001). Although the PSI has copious support for its reliability and validity, little research has been done to support the assumption that the short form is just as reliable and valid as the original. The following sections include a selective review of studies that included the PSI-SF among their measures. The studies selected are those that provide some support, either directly or indirectly, for the validity of the PSI-SF and/or its subscales. See Appendix A for a table summary of those studies and their findings.

Use of the PSI-SF in Parenting Research

As with the PSI, there are specific populations that have been studied using the PSI-SF. The PSI-SF was standardized for use with parents of children ages 10 months to 7 years. Most studies conducted using the PSI-SF included parents with young children from 8 months to 5 years of age (e.g., Brigg-Gowan, Cater, Moye-Skuban, & McCue-Horowitz, 2001). Other studies regarded the age of the child as inconsequential and allowed a broad

child age range (e.g., Willner & Goldstein, 2001). Some specific demographics represented in these studies include low income parents (Bhavnagri, 1999; Cowen 1999), mothers only (e.g., Button, Pianta, & Marvin, 2001; Douglas, 2000), parents with low educational level (Cowen, 1999), African American parents (Bhavnagri, 1999; Kelley, 1998), and parents of children with disabilities and medical conditions (Button, Pianta, & Marvin, 2001; Miller, Cate, & Johann-Murphy, 2001; Radcliffe, Bennett, Kazak, Foley, & Phillips, 1996). Several studies included abusive parents (Kelley, 1998; Silovsky & Niec, 2002), and others included parents with emotional health problems (Soliday, McCluskey-Fawcett, & O'Brien, 1999; Willner & Goldstein, 2001). Many studies had small numbers of parents participating ($n < 50$ or $n < 100$).

Researchers have used the PSI/SF to examine parenting stress using a variety of different research designs. In some studies, researchers determined group differences in parenting stress between groups of parents considered to be high and low risk for parenting stress (e.g., Irwin, Carter, & Briggs-Gowen, 2002; Kelley, 1998). Others studied variables hypothesized to be related to parenting stress, such as income, social support, and quality of childrearing experienced by parents themselves (e.g., Douglass, 2000; Smith, Oliver, & Innocenti, 2001). Several investigators used the PSI-SF to evaluate or inform interventions, such as in a pre-post test design (e.g., Bhavnagri, 1999; Cowen, 1999). In one study, the PSI-SF was used to validate another scale (Kazak, Penati, Waibel, & Blackall, 1996). All of these studies will be reviewed in more detail below. First will be a review of studies in which the PSI-SF was used with several different sample types. Then will be a review of the different

purposes for which the PSI-SF has been used in research. Finally, there will be a review of research on the psychometric properties of the PSI-SF.

Stress among parents of children with special needs. The PSI-SF is often used to examine parenting stress among parents of children with special needs, both psychological and medical. These parents tend to experience more parenting stress than parents of typical children due to the extra care their children need. Parents with special needs children should therefore score higher on parenting stress measures such as the PSI-SF. Irwin et al. (2002) used the PSI-SF to study the role of maternal stress in the social-emotional development of “late-talking” toddlers (ages 21-31 months). Mothers of 14 “late-talking” toddlers scored significantly higher on the Parent-Child Dysfunctional Interaction scale of the PSI-SF as compared to mothers of 14 control toddlers, supporting the hypothesis that mothers of “late talkers” would experience more parenting stress than mothers of typical toddlers. There were no significant differences between groups on the Parent Distress or Difficult Child scales. In addition, parents reported perceptions of child behavior using the Child Behavior Checklist (Achenbach, 1991). Groups differed on only one scale of the CBCL (Withdrawn), which would be expected since there were no differences on the Difficult Child scale of the PSI-SF. Because group differences were found in the expected direction using the PSI-SF, and because parents responded similarly on the CBCL and the PSI-SF, the results of this study lend some indirect support to the discriminant and convergent validity of the PSI-SF.

Another area of special needs often studied in relation to parenting stress is cerebral palsy. Button et al. (2001) compared levels of parenting stress among 64 primarily Caucasian mothers of 48 children (8 months to 4.5 years) with cerebral palsy to a group of mothers of

16 children without cerebral palsy. The majority of the families had two parents in the household. Other demographic characteristics showed a range of income and education levels among parents. Results indicated that there were group differences in maternal stress and that the child's level of impairment was a predictor of maternal stress as was the interaction between impairment and partner support. Specifically, mothers of children with severe CP reported significantly more parenting stress on the Parent-Child Dysfunctional Interaction and Parent Distress subscales of the PSI-SF, as well as on the Total PSI-SF, than did mothers of comparison children, even when covarying partner support. Regression analysis revealed that the level of child impairment predicted the amount of stress experienced by mothers. Partner support also appeared to predict stress but in the opposite manner than expected; more partner support appeared to *increase* maternal stress as measured by the PSI-SF. The explanation given for this finding was that partner support may have disturbed the primary caregiver's routines. This study provides indirect support for the convergent validity of the PSI-SF because, as expected, higher levels of child impairment predicted more parental stress.

In another study of parenting stress among parents of children with cerebral palsy, the PSI-SF was used to determine family adjustment after child surgery. Miller et al. (2001) examined parenting stress in a small sample ($n=17$) of primarily Caucasian, married, "stay-at-home" mothers of young children (mean age 4.4 years) with cerebral palsy before and after the children had surgery to decrease spasticity. Mothers reported higher levels of stress one year after the surgery than before the surgery, especially on the Parent-Child Dysfunctional Interaction scale on the PSI-SF. The researchers concluded that because the

scores on other two scales on the PSI-SF did not increase significantly over time, the increase in stress was primarily due to changes in the parent-child relationship over the course of the year after surgery and not due to individual maternal factors. It is important to note that this conclusion assumes that the PSI-SF is generally reliable over time. It is possible that the Parent-Child Dysfunctional Interaction Scale is simply not as reliable over time as the other scales on the PSI-SF. Abidin found a lower test-retest reliability for this scale ($\alpha = .68$) over 6 months than for the other scales and the total scale (alpha ranged from .78 to .85). This research question was not explored in the present study, however.

The PSI-SF also has been used to study parenting stress among parents of children who survived a brain tumor. Radcliffe et al. (1996) included the PSI-SF as part of a battery of scales to assess the family adjustment of 38 children (aged 6-18) and their parents 2-5 years after brain tumor diagnosis. It was hypothesized that mothers of children who had survived brain tumors would report more parenting stress than would the normative sample for the PSI-SF. Reports on all of the instruments (Vineland Adaptive Behavior Scales, Beck Depression Inventory, State-Trait Anxiety Inventory and Child Behavior Checklist) were within normal limits. However, scores on the Parent-Child Dysfunctional Interaction subscale of the PSI-SF were elevated. Aside from the elevation on that one particular subscale, Radcliffe et al. (1996) did not find elevations in the Difficult Child subscale or the Parent Distress subscale. Likewise, the Child Behavior Checklist (CBCL; Achenbach, 1991), a measure considered comparable to the PSI-SF/DC, and the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1973), a measure of parent feelings of distress similar to the PSI-SF/PD, also were not elevated. These findings provide some indirect

support for the convergent validity of the PSI-SF.

Finally, in a more substantial investigation of parents with special needs children, Smith et al. (2001) measured parenting stress among a large sample ($n=880$) of parents of young children (mean age = 2 years, 11 months) with disabilities. The families represented a wide range of demographic characteristics. Smith et al. (2001) hoped to determine what effect family functioning, as opposed to child functioning, would have on parenting stress. Results indicated that predictors of parenting stress included income, time available for parent-child interaction, and social support. These variables were much stronger predictors of parenting stress than were aspects of child functioning, such as child behavior as measured by the Battelle Developmental Inventory (BDI; Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984). Although child functioning was significantly correlated with the Total PSI-SF, the correlation between child functioning and the PSI-SF Parent Distress scale was not significant. This finding does reveal some discriminant validity for the Parent Distress scale.

In sum, the PSI-SF has been used to assess the adjustment of parents with children who have language delays, cerebral palsy, brain tumors, and other developmental and medical conditions. As expected, parents of children with special needs report higher levels of distress on the PSI-SF than parents of typically developing children. The PSI-SF appears to be useful for measuring overall parenting stress, but questions remain about the validity of the three PSI-SF subscales. In the majority of prior studies, the children in the samples were under the age of 5 years. It would be difficult to generalize findings from these studies to samples of older children. In addition, all of these prior studies included relatively small sample sizes (i.e., $n < 40$ in each group). Small samples are not unexpected due to the low-

incidence nature of the children's special needs; however, the small numbers make the findings questionable. It is possible that more differences between parents of children with special needs and parents of typical children on the PSI-SF subscales would become apparent if the sample were larger and statistical power were greater.

Stress among abusive parents. It is often hypothesized that increased parenting stress may lead to abusive parenting, and the nature of this stress and its relationship to parenting behavior is therefore important to study. Investigators have administered the PSI-SF to parents and caretakers of abused children and to parents who were abused as children. Silovsky and Niec (2002) studied stress using the PSI-SF among parents of 37 young children (ages 3-7) with sexual behavior problems. The purpose of the study was to evaluate children with sexual behavior problems across many domains, with parenting stress of caregivers as one of those domains. Forty-seven percent of the primarily Caucasian children had experienced physical abuse, 58% had witnessed domestic violence, and 38% had histories of sexual abuse.

As predicted, caregivers reported high levels of parenting stress, with the total PSI-SF scores and subscale scores all in clinical ranges (T scores above 75). When interviewed, parents indicated distress surrounding their children's inappropriate sexual behavior. The Difficult Child subscale mean T score was particularly high (T score of 88), which would be expected considering the high level of inappropriate behavior the children were exhibiting according to parent report both in interviews and on the Child Behavior Checklist (89% in the clinical range). Based on caregivers' stress levels, it was recommended that caregivers be included in intervention efforts for the children. It was suggested that reducing caregiver

stress may improve the quality of the caregiver-child relationship and children's social adjustment. This study provided support for the discriminant validity of the PSI-SF in terms of revealing high levels of stress for parents who were hypothesized to have higher levels of stress. Also, the study provided support for the convergent validity of the PSI-SF/DC subscale because scores on that subscale were corroborated by scores on the CBCL and by parent interview.

In another study that included abusive parents, Kelley (1998) examined parenting stress among 30 African American, low income, substance-abusing mothers of children less than 4 years old compared to a non-substance abusing group of 30 mothers. There were more substance-abusing mothers than non-substance abusing mothers with confirmed cases of abuse or neglect against the youngest child in the family. As expected, substance abusing mothers scored significantly higher on all three sub-scales on the PSI-SF. Forty-seven percent of the substance-abusing mothers scored in the clinical range for Total Stress on the PSI-SF as compared to 3.3 % of non-substance abusing mothers. Kelley concluded that substance-abusing mothers were at risk for increased levels of parenting stress and maladaptive parenting behavior. In addition, a relationship between abusive parenting and parenting stress was revealed. This study provided support for the validity of the PSI-SF and underscored the importance of the role of parenting stress in parenting behavior.

The PSI-SF also has been used to study parents who were abused themselves as children. Douglas (2000) compared the parenting stress of 34 mothers with a history of being sexually abused as children to 29 mothers with no such history. All women were in mental health outpatient care in Scotland. Mothers in the comparison group were attending the clinic

for a variety of other psychological problems such as generalized anxiety disorder, post-traumatic stress disorder, and eating disorders. Consistent with hypotheses, the sexually abused mothers experienced significantly more parenting stress, as measured by the Total Stress score on the PSI-SF, than the comparison mothers. Furthermore, there was a significant positive correlation between the Depression subscale on the General Health Questionnaire – 28 (GHQ-28; Goldberg, 1978), a test designed to detect psychiatric disorder, and the Total Stress score on the PSI-SF for both sexually abused mothers and comparison mothers. Specific relationships between the GHQ-28 and the subscales of the PSI-SF, however, were not investigated. In general, the correlation between the Depression subscale of the GHQ-28 and the PSI-SF lends some support to the validity of the PSI-SF, as do the higher scores on the PSI-SF for abused mothers.

In sum, the PSI-SF has been used in studies with abusive parents and mothers who had been abused as children. Scores on individual scales, such as the Difficult Child scale, were correlated with scores on related measures with known psychometric properties, such as the Child Behavior Checklist, allowing for support of the validity of the Difficult Child subscale. Other scales, however, were not evaluated individually. Again, the majority of the children in these studies were young (i.e., less than 5-years-old), and the sample sizes were small (i.e., $n < 50$ in each group).

Parent depression and parenting stress. Parenting stress has been found to correlate with maternal depression in many studies (e.g., Bigras, LaFreniere, & Dumas, 1996; Houch & Loper, 2002). Willner and Goldstein (2001) used levels of stress as measured by the PSI-SF to predict depression in 76 mothers of children (age 3-19 years; $M=11.8$) with a variety of

special needs including moderate to severe learning disabilities, autism, and behavioral problems. Participants were recruited through several schools in South Wales for children with special needs. There was a strong correlation ($r = .74$) between the Parental Distress scale on the PSI-SF and the total score on the Beck Depression Inventory (BDI; Beck & Steer, 1987). When feelings of defeat and entrapment were controlled for, the relationship between parental distress and depression was reduced but still significant. Four items on the Parental Distress subscale were then omitted because they were related to feelings of entrapment. Using the reduced 8-item scale, the relationship between parental distress and depression was no longer significant. Regression analyses revealed that perceptions of defeat and entrapment mediated the relationship between stress and depression in mothers of special needs children.

A second study included both mothers and fathers when using the PSI-SF to examine the link between stress and depression. Soliday, McCluskey-Fawcett, and O'Brien (1999) used the PSI-SF to measure postpartum feelings of 51 mothers and fathers. The PSI-SF, among other scales, was administered one month pre- and one month postpartum. The Total Stress score on the PSI-SF significantly predicted postpartum affect of both mothers and fathers as measured by parent interviews using the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) and the Center for Epidemiological Studies Depression Scale (Radloff, 1977). The results of Soliday et al. (1999) lend some support for the validity of the PSI-SF for both genders.

The two studies reviewed in this section demonstrate the ability of the PSI-SF to predict depression in parents of children with and without special needs. There are potential

clinical implications of predicting mental health status using the PSI-SF. For example, the PSI-SF could be used to determine which parents might benefit most from intervention. The sample sizes in these studies were larger than in previously mentioned studies (i.e., $n > 50$) and one study included fathers, unlike most other studies of parenting stress using the PSI-SF. These larger, more varied samples increase the generalizability of the results of validation studies based on the PSI-SF. The possible clinical benefits of understanding parenting stress, as well as the uncertain relationship between the subscales of the PSI-SF and measures of depression, underscore the need for psychometric studies of the PSI-SF.

Use of individual PSI-SF scales. The subscales within the PSI-SF have been used to measure constructs other than general parenting stress (e.g., the PSI-SF Difficult Child subscale as a measure of child behavior). For example, Briggs-Gowan, Carter, Moye-Skuban, and McCue-Horwitz (2001) administered the PSI-SF Difficult Child subscale as a measure of child behavior due to the general paucity of such measures for children under 2 years of age. The researchers were examining the prevalence of social-emotional and behavioral problems in a large community sample ($n = 1280$) of 1- and 2-year-olds. Social-emotional competence was measured using the Infant and Toddler Socio-Emotional Competence Assessment (Carter & Briggs-Gowan, 1999). Child behavioral problems were measured using the Child Behavior Checklist for Ages 2-3 (CBCL/2-3) and the PSI-SF/DC. The CBCL/2-3 was used to measure child behavior only in 2-year-olds. The percentage of parents reporting clinically significant scores on the CBCL/2-3 (11.8%) was higher than the percentage of parents reporting clinically significant levels on the PSI-SF Difficult Child scale (6%). The investigators speculated that this finding might have indicated that the CBCL/2-3 was a more

sensitive measure of child behavior than the PSI-SF/DC. Another possibility is that the finding may call into question the validity of the PSI-SF/DC. There was significant overlap in scores, however, between the CBCL/2-3 and the PSI-SF/DC for the two-year-olds, which gives additional credence to the use of the PSI-SF/DC for parents of one-year-olds. This overlap gives support to the convergent validity of the PSI-SF/DC as a child behavior measure. Further support was added to the convergent validity of the PSI-SF/DC when researchers found that children of parents with more extreme scores on the PSI-SF/DC were more likely to have problems with social-emotional competence.

Use of the PSI-SF to inform interventions. Studying the effect of stress on specific parenting skills can help to inform parenting interventions. Bhavnagri (1999) studied the relationship between maternal parenting stress and mothers' use of instructional strategies for promotion of peer relationships in young children (ages 2-3.5). The sample consisted of 42 low-income, African American mothers. Mothers who experienced higher levels of parenting stress were less likely to promote prosocial skills and more likely to invoke strategies to decrease antisocial skills. This study underscores the importance of understanding the role of parenting stress in parenting behavior and, in turn, the need to accurately measure parenting stress to determine which parents might be at risk for exhibiting less desirable parenting behaviors. The findings indicate that parenting stress should be considered when developing parenting skills training interventions. This study provided some support for the validity of the PSI-SF by establishing a relationship between high stress and infrequent use of strategies to promote prosocial skills among children.

In addition to informing parenting interventions, parenting stress can be used as a

treatment outcome variable to determine the success of parenting interventions. Cowen (1999) used the PSI-SF when evaluating a crisis childcare intervention program for families at risk for child abuse. The pilot project included 51 primarily Caucasian mothers in a predominantly rural Midwestern area. The majority of the mothers were unemployed, unmarried, and low-income. One of the major goals of the crisis childcare program was to reduce parental stress. As expected, parenting stress across all subscales significantly decreased after the intervention program. There also was a significant decrease in the reported incidences of child maltreatment in rural counties that offered a crisis childcare program as compared to counties that did not offer such a program. Cowen (1999) has demonstrated an important use of the PSI-SF: examining the effectiveness of an intervention program. The successful use of the PSI-SF to evaluate an intervention program justifies further research with more diverse samples.

Psychometric validation of other measures. The PSI-SF was used in one published study to test the psychometrics of other scales. Kazak, Penati, Waibel, and Blackall (1996) used the PSI-SF to validate the Perception of Procedures Questionnaire (PPQ), which is their 19-item measure of parent-reported child and parent distress related to procedures for treatment and diagnosis of childhood cancer. The PPQ was developed to measure parental perceptions of their children before and during treatment and also to measure parent distress. One hundred forty mothers and 96 fathers of children with leukemia in a first remission completed the PPQ, the PSI-SF, and the Pediatric Oncology Quality of Life Scale (Goodwin, Boggs, & Graham-Pole, 1994). Factor analysis of the PPQ revealed five factors, two that measured child distress and one that measured parent distress. It was expected that parental

ratings of child distress would correlate significantly with the Difficult Child and Parent Child Dysfunctional Interaction subscales of the PSI-SF, and that hypothesis was supported for mothers only. Likewise, the Parent Distress factor on the PPQ was expected to be significantly correlated with the Parent Distress scale on the PSI-SF, but that hypothesis was supported only for mothers. This study provides another example, in addition to Soliday et al. (1999), of potential gender differences in correlates of PSI-SF subscales. Although the PSI-SF was used to validate the PPQ, the PPQ also served inadvertently to validate the Parent Distress Scale on the PSI-SF in this particular sample of parents with children who had leukemia. It is important to note that it may have been premature to use the PSI-SF to validate a new measure such as the PPQ because so few psychometric studies had been conducted on the PSI-SF.

Psychometric Examinations of the PSI-SF

It is important to recognize that although investigators have administered the PSI-SF for a variety of research purposes, few have actually assessed its psychometric properties. This poses a problem for researchers in that the validity of extant research may be compromised if the PSI-SF is indeed not valid. Also, clinicians who have been using the PSI-SF as an outcome measure to evaluate interventions may need to question the conclusions of program evaluations until more support is found for the validity and reliability of the PSI-SF across different populations. At the time of this study, only two published studies had been designed specifically to assess the psychometric properties of the PSI-SF in addition to studies completed by Abidin (1995) with the original normative sample. Those studies will be reviewed in detail below.

First, the psychometrics of the PSI-SF were studied when it was developed and results were reported in the PSI-SF Manual (Abidin, 1995). The normative sample included 800 participants, a combination of two separate samples of mostly Caucasian, married mothers of young children who belonged to the same group pediatric practice in a small city in Virginia. Coefficient alpha was calculated as a measure of internal consistency. For Total Stress, Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC), alpha was .91, .87, .80, and .85, respectively. Test-retest reliability of the Total Stress scale and each subscale over a 6-month retest interval ($n = 270$) was .84, .85, .68, and .78, respectively. When compared to subscales on the original PSI, the Parental Distress subscale of the PSI-SF was highly correlated with the Parent Domain ($r = .93$) on the original PSI, the Difficult Child subscale was highly correlated with the Child Domain ($r = .87$) on the PSI, and the P-CDI subscale was moderately to highly correlated with the Child Domain ($r = .73$) and Parent Domain ($r = .50$), respectively. Abidin concluded that the validity of the PSI-SF was likely to be similar to that of the PSI, the scale from which it was derived. The initial three-factor structure of the PSI-SF was derived from principal components factor analysis of the original PSI, and this factor structure was then replicated in a second sample. Each of the PSI-SF subscales is comprised of items that loaded highly (.40 or greater) on one of three factors derived from the PSI, with the exception of three items that loaded highly on both the Difficult Child and Parent-Child Dysfunctional Interaction subscales.

In the first primarily psychometric study using the PSI-SF, researchers (Deater-Deckard, & Scarr, 1996) sought to determine parenting stress in a sample of 589 mostly Caucasian, upper middle class married parents. One purpose of the study was to validate the

factor structure of PSI-SF in a sample of mothers and fathers of children between the ages of 12 and 60 months. The Confirmatory Factor Analysis (CFA) revealed a poor fit for Abidin's three-factor model using all items. The Goodness of Fit Index (GFI) was .87 and a GFI of .90 to .95 is considered a good fit. Concern about goodness of fit led the researchers to conduct Exploratory Factor Analysis (EFA). The scree plot revealed some support for three factors, but an examination of factor loadings revealed low factor loadings for certain items. A better fit for a three-factor solution was obtained (GFI = .93) when a CFA was conducted after omitting 17 items that had loadings of less than .4 or items that loaded on more than one factor. The greatly modified scales were used in subsequent analyses.

Correlations were examined among a variety of parent and child criteria and the three subscales of the modified PSI-SF. Parent criteria consisted of marital dissatisfaction as measured by the Spouse Relationship subscale of the original PSI and emotional support as measured by the Emotional Support subscale of Marshall's Emotional and Instrumental Support scales (1989). Child criteria included measures of parent-reported child behavior as measured by the Emotionality subscale of the EAS Temperament Scale (Buss & Plomin, 1984) and the Manageability Index (Scarr et al., 1987). Results indicated fairly strong support for the validity of the subscales. Specifically, the Difficult Child scale showed excellent discriminant validity as it was more highly correlated ($p < .05$) with parent report of child behavior ($r_s = .39$ to $.54$) than with the previously mentioned parent criteria ($r_s = .13$ to $.29$). The Parent Distress scale also showed good discriminant validity. That is, correlations between the Parent Distress scale and the parent criteria ($r_s = .32$ to $.60$) were higher ($p < .05$) than between the Parent Distress scale and the child criteria ($r_s = .26$ to $.28$). The Parent

Child Dysfunctional Interaction scale was correlated with both parent and child measures for fathers ($r_s = .21$ to $.30$). In contrast, the Parent Child Dysfunctional Interaction scale was correlated significantly higher ($p < .05$) with child measures ($r_s = .19$ to $.25$) than with parent measures ($r_s = .05$ - $.11$) for mothers.

In general, Deater-Deckard and Scarr (1996) provided support for the validity of the PSI-SF and its three subscales. They also provided support for its use with Caucasian, middle class parents, a population not often focused on in previous studies using the PSI-SF.

Although Deater-Deckard and Scarr (1996) certainly expanded the research on the psychometrics of the PSI-SF, all validation measures used were parent-report instruments. The use of a homogeneous sample limits the generalizability of Deater-Deckard and Scarr's results. Finally, a three-factor solution and validation was only supported after about 50% of the items were omitted from the scale.

In the second independent examination of the psychometric properties of the PSI-SF, Reitman and colleagues (2002) examined the psychometric characteristics of the PSI-SF with a low income, mostly minority sample of 196 mothers of young children (mean age = 4.14 years) in a Head Start program. The researchers hypothesized that the PSI-SF and its subscales would have good internal consistency. They also expected that the scales would satisfy criteria for goodness of fit derived from a confirmatory factor analysis using Abidin's proposed three-factor structure. In addition, the researchers hypothesized that child behavior, parent mental health, and certain demographic variables would be significantly correlated with the related subscales of the PSI-SF. Child behavior was expected to be significantly related to the Difficult Child subscale, and parent mental health was expected to be significantly

related to the Parent Distress subscale. Finally, poor parent mental health and negative child behavior were expected to have a significant positive relationship with the Parent Child Dysfunctional Interaction subscale, and higher income and higher educational achievement were expected to have a negative relationship with that subscale.

As predicted, internal consistency was very good (PD = .88; P-CDI = .88, Difficult Child = .89 and Total Stress = .95). An initial CFA showed that a three-factor solution adequately described the data. By fixing the covariance between two of the factors (PCDI and DC) to 1, making those two a single factor, the researchers were able to test a nested two-factor model to determine whether the data would better fit that model. Finally, all three factors were combined to test a one-factor solution. All of the models tested appeared to “fit” the data with CFIs of .90, but the one-factor solution appeared to fit the data slightly better than the two- and three- factor solutions. Despite those findings, the authors conjectured that the three subscales might still have been clinically useful.

Multiple regression was used to examine the contribution of psychosocial and demographic factors to the PSI subscale scores to determine whether a three-factor structure was indeed clinically useful. Results showed support for the validity of the individual subscales. Child oppositionality on the Conners Parent Rating Scale-Revised: Long Form (Conners, 1997) predicted a significant amount of the variance in the Difficult Child subscale on the PSI-SF. Parental psychological symptoms, as measured by the Brief Symptom Inventory (Derogatis & Spencer, 1982), and low income predicted a significant amount of the variance in the Parent Distress subscale on the PSI-SF. Educational attainment did not predict a significant amount of the variance in the Parent Distress subscale. Parent report of

psychological problems, low educational attainment, and low income predicted a significant amount of the variability in the Parent-Child Dysfunctional Interaction scale.

The results supported the use of the PSI-SF with a population of African American mothers of young children and showed some support for the three subscales of the measure. Although Reitman et al. (2002) conducted the most comprehensive study of the psychometrics of the PSI-SF to date, the demographic range of the sample used was limited to low-income, minority parents. Deater-Deckard and Scarr (1996) also used a demographically limited sample, but of Caucasian, middle-class parents. It is encouraging that using each of these very different samples, there has been at least some support for a three-factor solution. In order to find that support, however, Deater-Deckard and Scarr (1996) omitted a large percentage of items.

Summary of Past Research Findings and Limitations

The PSI-SF has been used with increasing frequency to examine the impact of parenting stress on parenting behavior. Without good evidence of the validity of this widely used measure, inappropriate assumptions could be made about parenting in theory and in practice. Currently only three studies have been conducted specifically to analyze the psychometric properties of the PSI-SF. Due to the limited sample characteristics that exist in previous psychometric studies of the PSI-SF, there is a need to study the PSI-SF with a broader sample. In the current study, the PSI-SF was used with a wide variety of parents from all income and education levels and parents who exhibited a broad range of parenting behavior. In all, there were both mothers and fathers included in the present sample as well.

A second limitation of the past efforts to validate the PSI-SF is that researchers have exclusively employed parent report questionnaires to validate the subscales of the PSI-SF. The exclusive use of self-report methods to validate this measure introduced shared method variance. Parent perceptions of children's behavior are likely to overlap with parent perceptions of their own mental health and their relationship with their child simply because the same person is reporting the information on all three measures. Direct observation may or may not corroborate what the parents are reporting. The current study incorporated direct observation as well as parent-report questionnaires of child and parent behavior and parent mental health.

CHAPTER THREE

Statement of the Problem

There are several models that have been developed to explain the effects of parenting stress on parenting behavior and children's subsequent social adjustment. Abidin (1990), the developer of one such model, created two measures of parenting stress: the Parenting Stress Index (PSI), a 120 item measure, and its short form (PSI-SF) which consists of 36 items. The use of the PSI-SF has the potential to prevent fatigue that could accompany its longer companion scale, and allows for the collection of more information in the limited time that researchers and clinicians have with patients and participants.

As in all research, it is important to have valid and reliable methods to study constructs, and parenting stress is no exception. The PSI-SF is being used with increased frequency, but its psychometric underpinnings have not been explored fully. Research that has included the PSI-SF provides indirect support for its validity, but those studies have been limited in a number of ways. Many investigators have used small or demographically homogeneous samples, reducing the investigators' ability to find support for all subscales and to generalize findings to broader populations. In addition, a literature review conducted by this author revealed only two primarily psychometric studies of the PSI-SF. Those studies examined the factor structure of the PSI-SF and revealed only limited support for Abidin's (1995) proposed three-factor structure. The purpose of the current study was to examine the validity and internal consistency of the PSI-SF, as well as to investigate its factor structure. This was done using a heterogeneous sample of participants and included self-report and direct observation of child and parent behavior and parent mental health. Half of the parents

who were included in the sample for the present study had cases of substantiated physical abuse against their children. Previous research suggested that parenting stress is related to negative parenting behavior; thus, including more extreme parenting behavior such as child abuse (e.g., Kelley, 1998; Silovsky & Niec, 2002) was expected to provide a broad range of parenting stress.

Hypotheses

As previously stated, the Parenting Stress Index – Short Form and its three subscales (Parent Distress, Difficult Child, and Parent-Child Dysfunctional Interaction) were used to measure levels of parental stress due to the parenting role. Child behavior, parent behavior, and quality of relationship were measured using direct observation during Parent-Child Interactions (PCI) and using the Severity Scale on the Eyberg Child Behavior Inventory (ECBI), a parent-report measure of perceptions of child behavior. Parent mental health was measured using the depression subscale and the Global Symptom Index (GSI) from the Symptom Checklist – 90 – Revised (SCL-90-R), a self-report measure of psychopathological symptoms. For a complete description of these measures and their psychometric properties, please refer to the Method section. The following hypotheses were tested:

Hypothesis 1: The Total PSI-SF scale and each of the subscales would be internally consistent with alpha coefficients of .80 or higher.

Hypothesis 2: A three-factor model structure would be supported by a confirmatory factor analysis.

Research Question 1: Would a one-, two-, or three-factor model best fit the data?

To examine convergent validity, the following three hypotheses were tested.

Hypothesis 3: There would be significant correlations between Difficult Child subscale scores of the PSI/SF and scores on the two measures of child adjustment. Measures of child adjustment included a parent-report measure (ECBI - Severity subscale) and an observational measure (Child Behavior on the PCI).

- a. Scores on the Difficult Child subscale of the PSI-SF would be positively correlated with scores on the ECBI.
- b. Scores on the Difficult Child subscale of the PSI-SF would be negatively correlated with Child Behavior scores on the PCI.

Hypothesis 4: There would be significant correlations between Parent Distress subscale scores of the PSI/SF and scores on two measures of parent psychopathology. The measures of parent psychopathology included two scales of a self-report instrument (i.e., the Global Severity Index and Depression scales of the Symptom Checklist-90-Revised).

- a. Scores on the Parent Distress subscale of the PSI-SF would be positively correlated with GSI scores on the SCL-90-R.
- b. Scores on the Parent Distress subscale of the PSI-SF would be positively correlated with Depression scores on the SCL-90-R.

Hypothesis 5: There would be significant correlations between Parent Child Dysfunctional Interaction subscale scores of the PSI/SF and scores on two measures of parent/child interaction quality. The two measures were based on the PCI and included Parent Behavior and Quality of Relationship.

- a. Scores on the Parent Distress subscale of the PSI-SF would be negatively correlated with Parent Behavior scores on the PCI.
- b. Scores on the Parent Distress subscale of the PSI-SF would be negatively correlated with Quality of Relationship scores on the PCI.

To examine discriminant validity, the following three hypotheses were tested.

Hypothesis 6: Both child variables (ECBI and Child Behavior) would be significantly more highly correlated with the Difficult Child subscale than with the other two PSI-SF subscales.

Hypothesis 7: Both parent mental health variables (GSI and Depression) would be significantly more highly correlated with the Parent Distress subscale than with the other two subscales of the PSI-SF.

Hypothesis 8: Both measures of parent/child quality (Parenting Behavior and Quality of Relationship) would be significantly more highly correlated with the Parent Child Dysfunctional Interaction subscale than with the other two subscales of the PSI-SF.

CHAPTER FOUR

Method

Participants

Participants were 185 parents of children ages 4 – 10 selected from a group of participants in a larger study ($N = 209$) designed to examine the impact of parenting and child social cognition on children's peer social adjustment. From this larger study, 90 parents with reports of physical abuse referred by the Department of Human Services (DHS) were included in the sample for the current study. Ninety-five comparison parents from the community were matched with the 90 abusive parents across a wide range of demographic variables (See Table 1).

There were several criteria for inclusion in the larger study, and there was one additional criterion for inclusion in the present study. Criteria for inclusion in the sample of abusive parents in the larger study included (a) a report of abuse to the social services registry within the prior 12 months, (b) confirmation that the child/parent dyad was living in the same home, (c) an absence of a history of sexual abuse, and (d) the child was between the ages of 4 – 10 years. Criteria for inclusion in the sample of comparison parents were the same as those used for the abusive parents except that there could be no reported cases of abuse to the social services registry. The sole criterion for being included in the present study was that parents had completed the PSI-SF with a “defensive responding” score of 10 or below indicating that the parent completed the measure with an acceptable degree of honesty. Three abusive parents and eleven comparison parents were excluded from the present study due to defensive responding.

Table 1

Demographic characteristics of comparison (n = 95) and abusive (n = 90) participants and the full sample (n = 185)

| | Comparison | Abusive | χ^2 or <i>t</i> value | Full Sample |
|------------------|------------|----------|----------------------------|-------------|
| Parent Gender | | | .03 ns | |
| Female | 76 (80%) | 73 (81%) | | 149 (80%) |
| Male | 19 (20%) | 17 (19%) | | 36 (20%) |
| Child Gender | | | 2.4 ns | |
| Female | 51 (54%) | 38 (42%) | | 89 (48%) |
| Male | 44 (46%) | 52 (58%) | | 96 (52%) |
| Race | | | .28 ns | |
| Caucasian | 27 (29%) | 28 (31%) | | 55 (30%) |
| African-American | 65 (69%) | 60 (67%) | | 125 (68%) |
| Other minority | 3 (2%) | 2 (1%) | | 5 (2%) |
| Marital Status | | | .80 ns | |
| Married | 44 (47%) | 39 (43%) | | 83 (45%) |
| Single | 33 (35%) | 31 (34%) | | 64 (35%) |
| Separated | 11 (12%) | 10 (11%) | | 21 (11%) |
| Divorced | 7 (7%) | 10 (11%) | | 17 (9%) |

(table continues)

| | Comparison | Abusive | χ^2 or t value | Full Sample |
|--------------------------|-------------|-------------|-----------------------|-------------|
| Parent Education | | | 6.1* | |
| Partial high school | 13 (14%) | 21 (23%) | | 34 (18%) |
| High school grad | 22 (23%) | 28 (31%) | | 50 (27%) |
| Some College/Tech degree | 34 (36%) | 24 (27%) | | 58 (31%) |
| College degree | 26 (27%) | 17 (19%) | | 43 (23%) |
| SES (Hollingshead, 1975) | | | 2.6 ns | |
| I | 10 (11%) | 7 (8%) | | 17 (9%) |
| II | 27 (29%) | 22 (24%) | | 49 (27%) |
| III | 23 (25%) | 16 (18%) | | 39 (21%) |
| IV | 18 (19%) | 22 (24%) | | 40 (22%) |
| V | 16 (17%) | 23 (26%) | | 39 (21%) |
| Mean (SD) Parent age | 34.6 (7.2) | 34.2 (8.8) | .12 ns | 34.4 (8.0) |
| Mean (SD) Child age | 7.0 (1.2) | 7.5 (1.7) | 4.94** | 7.3 (1.5) |
| Mean (SD) Family size | 3.7 (1.3) | 4.1 (1.3) | 3.19* | 3.9 (1.3) |
| Mean (SD) Parent IQ | 94.3 (14.2) | 90.8 (14.1) | 2.4 ns | 92.7 (14.2) |
| Mean (SD) Child IQ | 98.3 (15.3) | 97.4 (11.6) | .16 ns | 98 (13.8) |

* $p < .10$, ** $p < .05$, for test of group difference between abuse and comparison samples.

To recruit abusive parents, social workers gave eligible parents a packet containing a description of the project and contact information for project staff. In addition, the primary investigator conducted a periodic review of the child protective services registry to identify eligible children. Recruitment materials were mailed directly to parents whose children were deemed eligible. Recruitment of comparison parents was done primarily by word-of-mouth and through distribution of flyers in community newsletters, agencies, childcare centers, and businesses in neighborhoods where abusive parents and their partners resided. Comparison parents were screened for abuse status and none of those parents were eligible for the abuse group.

Procedures

When parents called the project office, a psychosocial interview was conducted and, if parents met research criteria, they were invited to participate. Transportation to the university data collection site and childcare were available. Each parent who participated received \$75. A DHS Certificate of Confidentiality was obtained to protect parents from use of research records in court proceedings. Families were scheduled for a 3 – 4 hour data collection session, during which time informed consent was obtained and research staff administered measures for the current research.

Measures

Parenting stress. The Parenting Stress Index – Short Form (PSI-SF) is a 36 item short version of the larger Parenting Stress Index (PSI), developed by Abidin (1995). There are three subscales within the PSI-SF: Difficult Child, Parent Distress, and Parent-Child Dysfunctional Interaction. The Difficult Child subscale (12 items) represents behaviors that

children engage in that may make parental management of children more difficult. For example, one item states “My child gets upset easily over the smallest thing.” The Parental Distress subscale (12 items) measures distress parents feel about their parenting role usually in light of other personal stresses that relate to parenting. One example item states “There are quite a few things that bother me about my life.” Finally, the Parent-Child Dysfunctional Interaction subscale (12 items) focuses on parental beliefs that the child is not reinforcing to the parent and does not meet the parent’s expectations. An example item is “My child smiles at me much less than I expected.” Respondents are asked to provide some demographic information at the top of the form and then respond to each item using a 5-point Likert scale that ranges from Strongly Agree to Strongly Disagree. Higher scores indicate higher levels of parenting stress. The PSI-SF takes approximately 10 minutes to complete, although there is no time limit. Scores generated are raw scores that can be converted into percentiles. In the present study, raw scores were used for analyses because the relationship between raw scores and percentiles is not one-to-one. Scores at or above the 85th percentile are considered to be clinically significant. When scoring, responses to items 1, 2, 3, 7, 8, 9, and 11 make up the “Defensive Responding” score, which indicates to investigators if the respondent is “faking good.” These items are taken from the Parent Distress subscale and measure feelings of general distress related to being a parent.

Psychometric properties of the PSI-SF were reported in the PSI-SF Manual (Abidin, 1995). The PSI-SF subscales were derived from factor analyses of the longer, 120-item version (the PSI) that consistently showed a three-factor structure. In the normative sample of 800 mostly Caucasian, married mothers of young children, internal consistency (alpha) for

Total Stress, Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC), was .91, .87, .80, and .85, respectively. Test-retest reliability over a 6-month retest interval ($n = 270$) was .84, .85, .68, and .78, respectively. When compared to subscales on the original PSI, the Parental Distress subscale of the PSI-SF was highly correlated with the Parent Domain ($r = .93$) on the original PSI, the Difficult Child subscale was highly correlated with the Child Domain ($r = .87$) on the PSI, and the P-CDI subscale was moderately to highly correlated with the Child Domain ($r = .73$) and Parent Domain ($r = .50$), respectively. The initial three-factor structure of the PSI-SF was derived from principal components factor analysis of the original PSI, and this factor structure was then replicated in a second sample. Two other previously described studies were specifically designed to evaluate the psychometric properties of the PSI/SF. For detailed descriptions, please refer to Chapter 2.

Parenting behavior and affect. Parenting behavior and affect were measured using videotaped parent-child interactions (PCI), which were coded using a parent behavior coding scheme. The following is a description of the procedure for these interactions. Each parent-child dyad participated in three consecutive 10-minute play sessions similar to procedures used by others (e.g., Haskett & Smith-Scott, 1996; Sessa, Avenevoli, Steinberg, & Morris, 2001). The first session was a “free play” session in which the dyads were instructed to play together in a room and were provided with age-appropriate play materials (e.g., small blocks, markers, and paper). The second session was a structured “instructions” task in which parents were told to ask their children to clean up the play materials, draw a picture of a person, and then sit quietly while the parent read a magazine. In the final “teaching/frustration” session,

the dyads were involved in a timed teaching task in which parents were instructed to help their children quickly complete two age-appropriate puzzles. Parents were instructed to help their children without touching the puzzle pieces. A visible and audible timer was set for 10 minutes. All three situations were videotaped using a hidden camera. Parents and children were aware that their interactions were being recorded.

Parenting behavior and affect were then coded from videotapes by uninformed coders using the Qualitative Ratings of Parent-Child Interactions (Cox, 1997; Paley, Cox, & Kanoy, 2001). The six parenting dimensions coded were Positive Regard for the Child, Negative Regard for the Child, Sensitivity, Disengaged, Intrusiveness, and Flatness of Affect. In the present study, only the Positive Regard, Negative Regard, and Sensitivity dimensions were used. These codes were chosen because they best represented the item content on the PCDI subscale. The Positive Regard category represents the parent's verbal and physical warmth for the child by such behaviors as smiles, hugs, praise, and enthusiasm. Negative Regard refers to the intensity and frequency of parental negative affect toward the child; physical tension, harsh voice tones, and punitive comments are characteristic of this domain. The Sensitivity category refers to the degree to which the parent is responsive to the child's needs.

Scoring of the scales consisted of ratings from one through seven with "one" indicating that the category was not at all indicative of the observed parenting and "seven" indicating that the category under consideration was highly indicative of the observed parenting. Interrater reliability of codes for the six parent categories, measured using Pearson correlations (r), ranged from .73 to .94. Data generated by coding observations consisted of a

rating of 1 – 7 on each of the six parenting categories for each of the three 10-minute segments, for a total of 18 data points for each dyad. To reduce these data to a manageable format, a mean score that ranged from 1 – 7 was generated for each of the coded categories based on scores from the three sessions. A review of bivariate correlations of scores across the three segments showed significant inter-segment reliability, which justified averaging scores across situations. For the purposes of the present study, the Positive and Negative Regard and Sensitivity codes were averaged to create a Parent Behavior variable used for validation of the Parent Child Dysfunctional Interaction scale on the PSI-SF. Negative Regard codes were reverse coded before being combined with the Positive Regard and Sensitivity codes. The Parent Behavior variable ranged from 1-7 with higher numbers indicating more positive parenting behavior.

During its development, investigators used this coding scheme with 138 couples from a rural area of the southeastern United States. Ninety-seven percent of the couples were Caucasian and 3% were African-American (Paley et al., 2001). Most of the couples were lower to lower-middle class socioeconomic status. Interrater reliability was moderate to excellent on all codes ($r_s = .64 - .96$). The validity of this coding scheme was examined in two ways. First, investigators examined the relationship between the coding of whole family interactions and the coding of parent-child dyadic interactions and found them to be moderately related ($r_s = .39$ to $.69$) (Paley et al., 2001). Second, investigators examined the relationship between marital adjustment, as measured by the Ambivalence and Love subscales of the Four Factor Scale of Intimate Relations (Braiker & Kelley, 1976), and whole family interactions using their coding scheme, citing reviews of literature documenting

relationships between marital adjustment and dyadic parent-child interactions (e.g., Erel & Burman, 1995). The researchers found low to moderate correlations between the Ambivalence and Love subscales and whole family interactions both prenatally and 24 months after birth of the first child ($r_s = -.19$ to $-.33$) (Paley et al., 2001).

Child behavior and affect. Child behavior and affect were measured through direct observation and parent report. First, the same videotaped play sessions used to code parent behavior were coded for child behavior using a child coding scheme also developed by Cox (1997). The child coding scheme consisted of five categories: Positive Mood, Negative Mood, Engagement/Persistence, Compliance, and Quality of Relationship. In the present study, only the Positive Mood, Negative Mood, Compliance, and the Quality of Relationship dimensions were used. The Positive Mood category represents the child's positive mood by such behaviors as smiles, hugs, laughter, and other indicators of enthusiasm. The Negative Mood category refers to the child's negative mood based on behaviors such as showing physical tension, yelling, complaining, or crying. The Compliance category refers to the degree to which the child follows parent requests. The Quality of Relationship category refers to both parent and child behavior, and is a general code for the overall quality of their interactions. High levels of positive interaction between the child and the parent, as well as low levels of negative interaction between them, indicate high quality of relationship.

For the purposes of the present study, the Positive Mood, Negative Mood, and Compliance categories were averaged to create a Child Behavior score, which was used to determine the validity of the Difficult Child scale on the PSI-SF. Negative Mood was reverse coded before being combined with Positive Mood and Compliance. Child Behavior scores

had a possible range of 1 to 7 with higher numbers indicating more positive child behavior. The Quality of Relationship category was used to examine the validity of the Parent-Child Dysfunctional Interaction scale on the PSI-SF. Quality of Relationship scores also had a possible range from 1 to 7 with higher scores indicating a better quality parent-child relationship.

The coding scheme from which the present PCI coding scheme was derived was used with 138 majority Caucasian families from a rural area of the southeastern United States (Paley et al., 2001). Most of the families were lower to lower-middle class socioeconomic status. Interrater reliability for the child codes was very good ($r_s = .80 - .89$). Parent Sensitivity scores from the previously mentioned parent coding scheme were found to be positively correlated with Child Enthusiasm ($r = .60, p < .001$) and Child Compliance ($r = .39, p < .001$) scores. Child Enthusiasm is similar to the positive mood code used in the present study. Parent Sensitivity was negatively correlated with Child Anger ($r = -.52, p < .001$). In addition, Child Enthusiasm as coded while observing the entire family, was positively correlated with both Dyadic Mother-Child Enthusiasm ($r = .30, p < .001$) and Dyadic Father-Child Enthusiasm ($r = .31, p < .001$). Although the reliability and validity information for the child codes is limited, it was included in the present study to provide a direct observation measure of child behavior. Previous validity studies of the PSI-SF have only included parent report of child behavior.

In order to examine the validity of the PSI-SF Difficult Child subscale more completely, child behavior also was measured using the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999). This parent report rating scale is meant to be used with

parents of children from 2 to 16 years of age. The ECBI includes 36 items that are specific examples of child behaviors parents might witness at home (e.g., “verbally fights with brothers and sisters”). The parent is asked to rate how often the behaviors occur on a 7-point scale, with 7 being “almost always.” Scores are generated for two indicators of child behavior: the mean frequency with which the behavior occurs (the Severity scale) and the number of items considered to be a problem for the parent (the Problem scale). For the purposes of the present study, the ECBI Severity scale was used to attempt to validate the Difficult Child scale.

This scale has been shown to be highly reliable in a sample with a variety of demographic characteristics including a range of child ages and socioeconomic status (Eyberg & Pincus, 1999). The alpha coefficient for the Severity scale was .88 in a diverse sample of 798 participants. The K-R 20 coefficient was .93 for the Problem scale in the same sample. Several studies have been conducted to determine the validity of the ECBI. Webster-Stratton and Eyberg (1982) found that in a sample of parents of 35 children ages 3 to 5 years, scores for both scales on the ECBI were correlated with observations of child dominance, negative affect, and nonacceptance. Also in that study, the Colorado Child Temperament Inventory (Rowe & Plomin, 1977) was correlated with the ECBI in a variety of ways showing both convergent and discriminant validity. Finally, both ECBI scales were significantly correlated with the Parenting Stress Index (PSI) in a sample of 165 parents of children ages 2-10 (Eyberg, Boggs, & Rodriguez, 1992), with significantly higher correlations between the ECBI scales and the Child Domain than between the ECBI scales and the Parent Domain.

Parent emotional health. Parent emotional health was measured using the Symptom Checklist – 90 - Revised (SCL-90-R; Derogatis, 1983), a 90-item scale that provides a measure of mental health. Each item represents a problem or complaint people sometimes have. The participants are asked to rate how much discomfort that problem has caused them in the past 7 days on a 5-point scale of distress from “not at all” to “extremely.” The SCL-90-R generates mental health scores in a variety of areas including anxiety, depression, somatization, obsessive-compulsive, interpersonal sensitivity, hostility, phobic anxiety, paranoid ideation, and psychoticism, as well as three “general mental health scales.” For the purposes of the present study, the Global Severity Index (GSI), which is one of three overall mental health scores derived from the SCL-90, and the Depression scale, based on the results of Douglas (2000), were used in an attempt to validate the Parent Distress scale on the PSI-SF. The GSI and the Depression subscale each generate a raw score that is then converted into a *T* score.

Many studies have shown the SCL-90-R to be a valid and reliable measure of mental health (see Derogatis, 1983 for lengthy listing). Internal consistency studies indicate high alpha coefficients from .77 to .90 for the symptom dimensions in a sample of 219 “symptomatic volunteers” and the test-retest reliability in a sample of 94 psychiatric outpatients over a one week span ranged from .78 to .90 (Derogatis, Rickels, & Rock, 1976). Derogatis, Rickels, and Rock (1976) also compared the SCL-90 to the MMPI and found significant correlations for the appropriate scales. Factor analysis was employed in another study (Derogatis & Cleary, 1977) and despite some overlap between related dimensions (i.e.,

the Anxiety and Phobic Anxiety dimensions), the factor analysis supported the theoretical model for three “general mental health” scales and nine specific subscales.

CHAPTER FIVE

Results

Prior to addressing the hypotheses put forth in the present study, descriptive statistics, such as means and standard deviations, were obtained to check for data entry accuracy and for normal distribution of scores (See Table 2). The next set of analyses was a partial replication of the data analyses conducted by Reitman and colleagues (2002) to examine the internal consistency and factor structure of the PSI-SF (See Tables 3 and 5). Finally, correlations and correlation comparisons were conducted to examine the convergent and discriminant validity of the PSI/SF (See Tables 4 and 6).

Tests of Internal Consistency

For hypothesis one, the full PSI-SF and its three subscales were subjected to tests of internal consistency using Cronbach's alpha (See Table 3). It was expected that each scale would be internally consistent at the .80 level or greater, as .80 was the lowest level of internal consistency established by Abidin (1995) with the normative sample on any of the PSI-SF subscales. Most researchers consider alpha coefficients of .80 and above to be the standard for good internal consistency. Alpha coefficients for Parent Distress, Parent-Child Dysfunctional Interaction, Difficult Child, and Total Stress were .83, .78, .80, and .80 respectively.

Tests of Factor Structure

For hypothesis two and research question one regarding the factor structure of the PSI-SF, all of the items from the PSI-SF were entered into a Confirmatory Factor Analysis

Table 2

Means and standard deviations for measures of parenting stress, child and parent behavior, and parent psychopathology

| | <i>n</i> | <i>M</i> | <i>SD</i> | Range |
|--|----------|----------|-----------|----------------|
| Parenting Stress Index – Short Form ^a | | | | |
| Total | 185 | 83.97 | 20.37 | 43.00 – 141.00 |
| Parent Distress | 185 | 29.42 | 7.46 | 16.00 – 49.00 |
| Dysfunctional Interaction | 185 | 23.91 | 8.37 | 12.00 – 51.00 |
| Difficult Child | 185 | 30.61 | 8.20 | 12.00 – 53.00 |
| Parent-Child Interactions ^a | | | | |
| Child Behavior | 168 | 5.32 | 0.67 | 2.89 – 6.67 |
| Parent Behavior | 159 | 4.48 | 0.96 | 1.89 – 6.89 |
| Quality of Relationship | 168 | 4.40 | 1.21 | 1.33 – 7.00 |
| Eyberg Child Behavior Inventory ^a | | | | |
| Severity | 141 | 3.00 | 0.89 | 1.05 – 5.61 |
| Symptom Checklist 90 – Revised ^b | | | | |
| Depression | 185 | 55.67 | 9.44 | 34.00 – 80.00 |
| Global Severity Index | 185 | 56.21 | 9.94 | 32.00 – 80.00 |

^a raw scores. ^b *T* scores.

Table 3

Internal consistency (Cronbach's alpha) and inter-scale correlations

| Scale | 1. | 2. | 3. | 4. | α |
|-------------------------------------|-----|-----|-----|-----|----------|
| 1. Difficult Child | 1.0 | | | | .80 |
| 2. Par-Ch Dysfunctional Interaction | .66 | 1.0 | | | .78 |
| 3. Parent Distress | .48 | .58 | 1.0 | | .83 |
| 4. Total Stress | .84 | .89 | .80 | 1.0 | .80 |

Note. All correlations are significant at $p < .0001$.

(CFA) using the AMOS Structural Equation Modeling software program (Arbuckle & Wothke, 1999). It was expected that a three-factor model would provide a good fit for the PSI-SF data. A CFA requires that the researcher specify a certain number of factors to be confirmed by the analysis. This procedure is different from the more commonly used Exploratory Factor Analysis (EFA) because an EFA does not require that a number of factors be specified. A CFA begins with the assumption that a certain number of factors are present. Because previous investigators have derived a three-factor solution using EFA (Abidin, 1995; Deater-Deckard & Scarr, 1996; Reitman et al., 2002) and there are three proposed scales within the PSI-SF, a three factor model was the first tested. Items were associated with each of three expected variables in the model according to the subscales of the PSI-SF. A “comparative fit index” (CFI), one of several indices of model fit, was computed. A CFI of .90 to .95 is considered moderate, and a fit of greater than .95 is considered excellent (Hu & Bentler, 1999). It was expected that a three-factor model would provide at least a moderately good fit for the sample data. This hypothesis, however, was not supported because the three-factor model revealed a CFI of .79 (See Table 4).

It was unknown whether a one- or two-factor solution would fit the data as well or better than a three-factor solution. Therefore, the CFA was repeated with two factors by fixing the covariance between Parent-Child Dysfunctional Interaction and Difficult Child to one, which would essentially allow those two factors to act as a single factor. This two-factor model also failed to provide a good fit (CFI = .78). The final analysis was conducted to determine whether or not a single “general stress” factor would best represent the data. This analysis was conducted by setting all covariances to zero. This model also failed to provide a

good fit (CFI = .71). For a complete summary of fit statistics for these models, please refer to Table 4. If each model had provided a good fit, the CFIs from each of the one-, two-, and three-factor nested models would have been compared using chi-square analysis. Given that none of the CFIs was above .90, however, those analyses were deemed unnecessary.

Tests of Convergent Validity

Hypothesis three, which stated that the Difficult Child subscale of the PSI/SF would be significantly correlated with Child Behavior as measured by direct observation during the PCI, was not supported, $r(168) = -.14, p > .05$. However, the hypothesis that the Difficult Child scale of the PSI/SF would be significantly correlated with child behavior as measured by the ECBI was supported, $r(141) = .60, p < .001$.

Hypothesis four, which stated that the Parent Distress subscale of the PSI/SF would be significantly correlated with parent mental health as measured by the Depression scale of the SCL-90-R, was supported, $r(185) = .56, p < .001$. The hypothesis that the Parent Distress scale of the PSI/SF would be significantly correlated with parent mental health as measured by the GSI of the SCL-90-R also was supported, $r(185) = .54, p < .001$.

Hypothesis five, which stated that the Parent-Child Dysfunctional Interaction subscale of the PSI/SF would be significantly correlated with Parent Behavior as measured by direct observation of the PCI, was supported, $r(159) = -.20, p < .05$. The hypothesis that the Parent-Child Dysfunctional Interaction subscale of the PSI/SF would be significantly correlated with the quality of the parent-child relationship as measured by direct observation of the PCI was not supported, $r(168) = -.11, p > .05$. For a summary of correlational analyses, see Table 5.

Table 4

Confirmatory factor analysis of PSI-SF factor structure

| Model | χ^2 | Model <i>df</i> | <i>p</i> < | CFI | RMSEA (90% CI) |
|--------------|----------|-----------------|------------|-----|--------------------|
| One factor | 1200.86 | 594 | .01 | .71 | .014 (.013 - .016) |
| Two factor | 1064.95 | 592 | .01 | .78 | .013 (.012 - .014) |
| Three factor | 1031.09 | 591 | .01 | .79 | .012 (.011 - .014) |

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 5

Correlations between PSI-SF subscales and validation variables

| Validation Variables | Parent-Child | | | |
|---------------------------------|--------------------|--------------------|------------------------------|----------------|
| | Difficult Child | Parent Distress | Dysfunctional Interaction | Total |
| Parent-Child Interaction | | | | |
| Child Behavior | -.14 | -.14 | -.20** | -.20** |
| CI (95%) | (-.22 to -.06) | (-.22 to -.06) | (-.28 to -.12) | (-.28 to -.12) |
| Parent Behavior | -.17* | -.09 | -.20* | -.18* |
| CI (95%) | (-.25 to -.09) | (-.17 to -.01) | (-.28 to -.12) | (-.28 to -.12) |
| Quality of Relationship | -.02 | -.07 | -.11 | -.08 |
| CI (95%) | (-.10 to .06) | (-.15 to .01) | (-.19 to -.03) | (-.16 to .00) |
| ECBI: Severity | .60*** | .30*** | .50*** | .55*** |
| CI (95%) | (.51 to .69) | (.21 to .39) | (.41 to .59) | (.46 to .64) |
| SCL-90-R | | | | |
| Depression | .43*** | .56*** | .32*** | .51*** |
| CI (95%) | (.35 to .51) | (.48 to .64) | (.24 to .40) | (.43 to .59) |
| Global Severity Index | .52*** | .54*** | .38*** | .56*** |
| CI (95%) | (.44 to .60) | (.46 to .62) | (.30 to .46) | (.48 to .64) |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Tests of Discriminant Validity

For the following comparisons of correlations, Williams' T was used, as recommended by Steiger (1980) as a substitute for Hotelling's T which has an increased risk of Type I error. Williams' T has a t -distribution with $df = N-3$ (Pickering, n.d., Comparing Correlations Within a Single Sample section, para. 4). A special computer program was used to calculate Williams' T based on the correlations between the comparison variable (e.g., ECBI) and each PSI-SF subscale, as well as the correlation between the subscales being compared (Pickering, n.d.). A Bonferroni adjustment was used to control for inflated alpha due to multiple (12) comparisons. The adjustment required that the p -value for each t -test be less than .004 for the difference between the correlations to be considered significant. It should be noted that the adjustment greatly increases the stringency of these tests. See Table 6 for a summary of correlation comparisons.

Hypothesis six, which stated that both child variables (ECBI and Child Behavior) would be significantly more highly correlated with the Difficult Child subscale than with the other two subscales of the PSI-SF, was partially supported. As predicted, the ECBI was significantly ($p < .001$) more highly correlated with the Difficult Child subscale ($r = .60$) than with the Parent Distress subscale ($r = .30$). The ECBI, however, was not significantly more highly correlated with the Difficult Child subscale ($r = .60$) than with the Parent-Child Dysfunctional Interaction subscale ($r = .50$). Child Behavior was not found to be more highly correlated with the Difficult Child subscale ($r = -.15$) than the Parent Distress ($r = -.14$) or Parent-Child Dysfunctional Interaction subscales ($r = -.20$).

Table 6

Comparisons of correlations among the PSI-SF subscales and validation variables

| Pairs | (r) | <i>n</i> | <i>df</i> | <i>t</i> |
|-------------------------|---|----------|-----------|----------|
| ECBI | | 141 | 138 | |
| | Difficult Child (.60) vs. Parent Distress (.30) | | | 4.20**** |
| | Difficult Child (.60) vs. P-CDI (.50) | | | 1.46 |
| Child Behavior | | 168 | 165 | |
| | Difficult Child (-.15) vs. Parent Distress (-.14) | | | <.000 |
| | Difficult Child (-.15) vs. P-CDI (-.20) | | | .83 |
| GSI | | 185 | 182 | |
| | Parent Distress (.54) vs. Difficult Child (.52) | | | 0.38 |
| | Parent Distress (.54) vs. P-CDI (.38) | | | 2.87**** |
| Depression | | 185 | 182 | |
| | Parent Distress (.56) vs. Difficult Child (.43) | | | 2.17* |
| | Parent Distress (.56) vs. P-CDI (.32) | | | 4.26**** |
| Parent Behavior | | 159 | 156 | |
| | P-CDI (-.20) vs. Difficult Child (-.17) | | | -.52 |
| | P-CDI (-.20) vs. Parent Distress (-.09) | | | -1.60 |
| Quality of Relationship | | 168 | 165 | |
| | P-CDI (-.11) vs. Difficult Child (-.02) | | | -1.42 |
| | P-CDI (-.11) vs. Parent Distress (-.07) | | | -.58 |

Note. P-CDI = Parent Child Dysfunctional Interaction.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .004$.

Hypothesis seven, which stated that both parent mental health variables (GSI and Depression) would be significantly more highly correlated with the Parent Distress subscale than with the other two PSI-SF subscales, was partially supported. As predicted, the GSI of the SCL-90-R was significantly ($p < .001$) more highly correlated with the Parent Distress subscale ($r = .54$) than with the Parent-Child Dysfunctional Interaction subscale ($r = .38$). The GSI was not, however, significantly more correlated with Parent Distress ($r = .54$) than with the Difficult Child subscale ($r = .52$). Also as expected, the Depression subscale of the SCL-90-R was significantly ($p < .001$) more highly correlated with the Parent Distress subscale ($r = .56$) than with the Parent-Child Dysfunctional Interaction subscale ($r = .32$). The Depression subscale was not more highly correlated with the Parent Distress subscale ($r = .56$) than the Difficult Child subscale ($r = .43$) at the $p < .004$ level. However, the correlation between the Depression subscale and the Parent Distress subscale was significantly higher than the correlation between the Depression subscale and the Difficult Child subscale at the $p < .05$ level.

Hypothesis eight, which stated that both measures of parent/child quality (Parent Behavior and Quality of Relationship) would be significantly more highly correlated with the Parent-Child Dysfunctional Interaction subscale than with the other two subscales of the PSI-SF, was not supported.

Discussion

The use of the PSI-SF is becoming more widespread as investigators and clinicians seek ways to gather data on parenting stress efficiently. It is, therefore, important to determine the validity and reliability of this instrument before it is used to draw conclusions

about parenting. In the present study, the internal consistency, factor structure, and convergent and discriminant validity of the PSI-SF were examined.

Internal Consistency of the PSI-SF Subscales and Total Scale

It was expected that the instrument would be internally consistent both in its subscales and in the instrument as a whole. The Parent Distress and Difficult Child subscales as well as the Total Stress scale were found to be internally consistent with alpha coefficients of .80 or greater. The alpha coefficient for the Parent-Child Dysfunctional Interaction subscale was not found to be internally consistent at the .80 level ($\alpha = .78$). These findings are similar to internal consistency established by Abidin (1995) and others (Deater-Deckard & Scarr, 1996; Reitman et al., 2002). They indicate that items in two of the subscales and items in the overall instrument are highly related to one another. Items on the Parent-Child Dysfunctional Interaction subscale may not be as highly related to one another as the items in the other subscales are interrelated.

Factor Structure of the PSI-SF

A three-factor structure was expected to be supported by the present data. That structure, however, was not supported. The confirmatory factor analysis did not reveal a good fit for the data. Although the findings from previous studies led to the expectation of a fit for a three-factor model, it is important to note that these previous studies only found marginal support for three factors. In fact, Deater-Deckard and Scarr (1996) did not find a good fit for their data using a three-factor model in confirmatory factor analysis. Their subsequent exploratory factor analysis revealed some support for a three-factor solution, but a “clean” factor solution was found only after omitting 17 items from this already brief 36-item scale.

In addition, although Reitman (2002) and colleagues did find a good fit for a three-factor model, a one-factor solution was found to fit slightly better than a two- or three-factor solution.

There are several possible reasons for the lack of fit for a three-factor model in the present study. First, the lack of fit in previous studies and in the present study may be due to the use of a CFA, a more stringent test of factor structure than was used in other samples. Abidin (1995) derived a three-factor structure from an EFA based on a sample of 800 participants. Deater-Deckard and Scarr (1996) were not able to find support for a three-factor structure using CFA, and a clean factor solution was not found using an EFA until approximately 50% of the items were omitted. Reitman and colleagues (2002) found that a three factor structure fit the data using a CFA, but they also found that a one- or two-factor solution also fit the data. In fact, a one-factor solution was found to fit the data slightly better than the other two solutions. It is easier to find support for a proposed structure using EFA because no particular factor structure is imposed on the data at the start of the analysis. Factors and their meaning are subjectively determined by investigators after the analysis. In CFA, the exact structure is hypothesized before the analysis is run, and the data either fit the proposed model well or they do not. Therefore, CFA does not accommodate cross-loadings of items, while the subjective interpretation of an EFA allows some degree of cross-loading to be acceptable. This process makes CFA a much more stringent test of factor structure than EFA.

Another possible reason for the lack of fit in the present study is related to the gender of the parents. Both Deater-Deckard and Scarr (1996) and the present investigator included

fathers in their samples, while Reitman and colleagues (2002) and Abidin (1995), who found some evidence for a three-factor structure, included only mothers. There were 33 fathers included in the present sample. There may be gender differences in terms of the correlates of parenting stress that are affecting the results in the present study. In previous studies, while parenting stress levels were not different for men and women, there were differences in other factors that are related to parenting stress (Deater-Deckard, 1998). For example, parenting stress in mothers may be more related to characteristics of the child, while parenting stress in fathers may be more related to aspects of the marital relationship (Stoneman, Brody, & Burke, 1989). Also, Deater-Deckard and Scarr (1996) found that there was poor discriminant validity of the Parent Distress subscale for fathers. Fathers' scores on the Parent-Child Dysfunctional Interaction subscale were correlated similarly with both parent and child criteria variables, but mothers' scores on that subscale were more highly correlated with child criteria variables. It has been proposed that gender differences in scores on the PSI-SF may be influenced by egalitarian views in the home and by marital dissatisfaction (Deater-Deckard & Scarr, 1996). Given these factors, fathers may respond to items in the subscales of the PSI-SF differently than mothers. Mother's overall parenting stress may depend more on the items in the Difficult Child subscale while father's overall parenting stress may depend equally on items in the Parent Distress and Difficult Child subscales. These differences may affect the factor structure of the PSI-SF because there may be more cross-loading of items for fathers than for mothers.

Finally, the lack of fit for a three-factor structure may be due to the age of the children of parents in the present sample. The PSI-SF was used with parents of young

children (ages 5 years and under) in previous studies that contributed to the understanding of the psychometric properties of the PSI-SF. Ages of parents' children in the present study ranged from 4 to 10 years. It is possible that parents of younger children may answer items in certain subscales differently than parents of slightly older children. Relationships between parents and children are bidirectional, and parenting stress can be influenced by parent reactions to children's behavior (Deater-Deckard, 1998). As children grow older and reach a period between early childhood and puberty, they are more able to control their own behavior and have increased autonomy (Maccoby, 1984). Parents are less likely to use corporal punishment, and are more likely to reason with children (Kuckzynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987). Parenting stress is affected by these developmental changes. In previous research (Deater-Deckard & Scarr, 1996), parents of older preschoolers perceived them as more behaviorally difficult, but mothers reported less parenting stress related to parenting older preschoolers than to parenting toddlers. If these differences are apparent even between pre-schoolers and toddlers, the differences could be even more pronounced between toddlers and school-age children. Items on the three subscales of the PSI-SF may not apply or may apply differently to parents of older children. Therefore, the original factor structure of the PSI-SF may not be valid with parents of older children.

In sum, the proposed three-factor structure was not supported in the current sample, a finding that may be due to the stringency of the CFA as compared to the more subjectively interpreted outcome of EFA. Parent gender and child age may also be factors that affect the factor structure of the PSI-SF, and these variables should be explored in future research.

Validity of the PSI-SF Subscales

In order to determine support for the convergent and discriminant validity of the PSI-SF, each subscale was examined to determine whether some subscales were more highly related than other subscales to certain variables. For example, the Difficult Child subscale was expected to be more highly related than the Parent Distress and Parent-Child Dysfunctional Interaction subscales to parent report and direct observation of child behavior. This type of finding would support the use of three separate subscales for measuring parenting stress. Results were mixed in terms of finding support for the convergent and discriminant validity of the PSI-SF.

Difficult Child Subscale. There was some support for the convergent validity of the PSI-SF Difficult Child subscale. Specifically, parent reports of child behavior on the PSI-SF and a separate parent report measure of child behavior (ECBI) were highly consistent; however, PSI-SF Difficult Child scores were unrelated to observations of child behavior. This finding is not unusual given that variables with like methodology (i.e. parent report measures) are more likely to be related than variables measured using different methodology. The relationship between the Difficult Child subscale and other parent reports of child behavior has been found in other studies (e.g., Reitman et al., 2002; Silovsky & Niec, 2002).

In terms of discriminant validity, the parent report of child behavior was found to be more related to Difficult Child subscale than to the Parent Distress subscale as expected, but it was similarly related to the Parent-Child Dysfunctional Interaction subscale. Direct observation of child behavior was not more related to the Difficult Child subscale than to any other PSI-SF subscale.

The lack of relationship between the Difficult Child subscale and the direct observation of child behavior may be due to two different factors. First, it is difficult to generalize behavior observed during a one-half hour period under optimal conditions in a clinical setting to the behavior the child exhibits on a daily basis with his or her parents. In the clinical setting, both parents and children are free from distractions and competing responsibilities that may normally occur at home. In addition, children may be more compliant in settings outside the home and may be more interested in the novel toys available in the laboratory situation. Second, combining the child codes by averaging across codes may have reduced some of the variability in child behavior due to regression toward the mean. By averaging the child codes across situation and across variables within the coding scheme, some of the more extreme scores on the 1 to 7 scale were lost. Therefore, the resulting child behavior scores were more likely to be closer to the middle of the range (a score of 4) than they would be if they were used separately. With this restriction of range, a strong correlation was less likely to be found between the Difficult Child subscale and the coded observations.

Parent Distress Subscale. There was support found for the convergent validity of the Parent Distress subscale. As expected, the Parent Distress subscale was significantly and positively correlated with parents' report of overall mental health (GSI) and their reports of depression. Previous researchers also have found a relationship between the PSI-SF Parent Distress subscale and parent report of their own mental health (e.g., Douglass, 2000; Reitman, et al., 2002; Willner & Goldstein, 2002). In terms of discriminant validity, the GSI and the Depression subscale from the SCL-90 were more highly related to the Parent Distress

subscale than to the Parent-Child Dysfunctional Interaction subscale, but only at the .05 level. In previous research, depression has been found to be strongly related to the Parent Distress scale on the PSI-SF, but the relationship of depression to Parent Distress as compared to the other PSI-SF subscales has not been examined (Douglass, 2000; Willner & Goldstein, 2001). The present study goes further than previous studies by providing some support for the discriminant validity of the Parent Distress subscale in terms of its relationship to depression.

Parent-Child Dysfunctional Interaction Subscale. There was essentially no support for the convergent or discriminant validity of the Parent-Child Dysfunctional Interaction subscale. The Parent-Child Dysfunctional Interaction subscale was not highly related to direct observation of parent behavior, and there was no relationship between that subscale and the Quality of Relationship dimension as coded during the parent-child interactions. In addition, Parent Behavior and Quality of Relationship were not more highly related to the Parent-Child Dysfunctional Interaction than to the other subscales on the PSI-SF. The same issues addressed earlier regarding direct observation of behavior may apply here as well. Previous research, however, suggests that there is less support for the Parent-Child Dysfunctional Interaction as a separate measure from the other two subscales than there is for the Parent Distress and Difficult Child subscales (e.g., Abidin, 1995; Deater-Deckard & Scarr, 1996). Abidin's (1995) analysis revealed that the Parent Child Dysfunctional Interaction subscale was less internally consistent than the other subscales with an alpha coefficient of less than .80. It was also correlated with both the parent *and* child dimensions of the original PSI-SF, while the Parent Distress and Difficult Child subscales were very

highly related to the Parent and Child dimensions of the PSI, respectively (Abidin, 1995). Deater-Deckard and Scarr (1996) found that the Parent Child Dysfunctional Interaction scale was moderately related to both parent and child measures for fathers, but was more highly related to child measures than to parent measures for mothers. This finding was not the case for the other two PSI-SF subscales (Deater-Deckard & Scarr, 1996). Taken together, past findings combined with these findings suggest that the Parent-Child Dysfunctional Interaction subscale has little validity as a measure of a separate dimension of parenting stress.

Interpretation of Findings and Future Directions

The present study has many strengths that have allowed it to contribute to the current literature regarding the psychometric properties of the PSI-SF. The sample was heterogeneous and presented a wide range of parenting stress and behavior. Fathers, who are not often represented in parenting stress research, were included in the sample. The use of the more stringent CFA to test factor structure, as compared to the more subjective EFA, allowed for a deeper understanding of the usefulness of the subscales of the PSI-SF. The examination of the validity of the PSI-SF included multiple methodologies such as direct observation of parent and child behavior in addition to parents' reports of such behavior.

As previously mentioned, there are several characteristics of the present study that may have contributed to the failure to find support for a three-factor structure for the PSI-SF. First, CFA provided a very stringent test of factor structure. Future exploration of the current data using EFA may show support for three unique factors. Second, the inclusion of fathers in the present study also may have affected the factor structure of this scale. In future studies,

the factor structure of the PSI-SF should be examined separately for mothers and fathers. Finally, the present study expanded the study of the PSI-SF factor structure by examining it for parents of older children. Comparisons in factor structure between parents of older and younger children may provide differential support for the use of the PSI-SF in one population than the other.

Despite these limitations and the failure to find support for a three-factor structure, one cannot ignore the previous failed attempts to find this structure in the PSI-SF (Deater-Deckard & Scarr, 1996; Reitman et. al, 2002). The findings of Deater-Deckard and Scarr (1996) indicate that the PSI-SF may indeed have a three-factor structure if a considerable number of items were omitted. An extensive item analysis would determine whether or not the PSI-SF could indeed be reduced to include fewer items. Given the current findings and the results of recent investigations, it may be prudent for the original developer of the short form to reassess the subscales and factor structure of the instrument.

There are also some characteristics of the present study that may have influenced the support or lack thereof for the validity of the subscales of the PSI-SF. Although there was support for the validity of Parent Distress and Difficult Child subscales using self-report data, support was not found using direct observation of parents and children during interactions together. In the future, researchers should consider the use of more long-term observation or more natural observation in the home to allow for a more representative sample of parent-child interactions. In fact, a thorough evaluation of the validity of the Parent-Child Interaction coding scheme also may be warranted. In addition, further exploration of the relationship between direct observation variables and the PSI-SF could be done by separating

the observational codes to avoid regression toward the mean and allow for more variability in scores. Little support was found for the third subscale on the PSI-SF, Parent-Child Dysfunctional Interaction. This subscale has had less support for its reliability in past research (Abidin, 1995), and has not often been studied in other research (e.g., Soliday et al., 1999; Willner & Goldstein, 2001). Results were mixed in Deater-Deckard and Scarr's (1996) study in terms of the discriminant validity of the Parent-Child Dysfunctional Interaction subscale. The Parent-Child Dysfunctional Interaction subscale was related to both parent and child measures for fathers, but was more related to child measures for mothers (Deater-Deckard & Scarr, 1996). Reitman and colleagues (2002) found that parent report of psychological problems was related to both the Parent Distress and Parent-Child Dysfunctional Interaction subscales on the PSI-SF. Although there appears to be some overlap between the Parent-Child Dysfunctional Interaction subscale and the other two subscales, the Parent-Child Dysfunctional Interaction subscale was elevated above the other two subscales among parents of children with special needs in several studies (e.g., Button et al., 2001; Irwin et al., 2002; Miller et al., 2001). More research is needed on this subscale to determine if it is measuring an important construct independent of the other two PSI-SF subscales.

Conclusions

Overall, the PSI-SF seems to be a strong tool for measuring parenting stress. Although results are mixed with regard to the validity of the three subscales of the PSI-SF, there is evidence to support the validity of the Difficult Child and Parent Distress subscales at least when using self-report methodology. The Parent-Child Dysfunctional interaction

subscale was not as well supported and clinicians should use caution when using this subscale to evaluate parents' relationships with their children for the purposes of family intervention. Although a three-factor structure was not supported in the present study, the Parent Distress and Difficult Child subscales may still have clinical usefulness. The findings in the present study also indicate that more research on gender differences on the PSI-SF is necessary, and because those gender differences are still unknown caution may be needed when using the PSI-SF with samples including fathers. It is possible that fathers may report or experience parenting stress differently from mothers. It is possible that caution also should be exercised when using the PSI-SF with parents of older children, and more research is needed in this area. Parents of older children may not experience as much parenting stress even if they see their children as more behaviorally difficult (Deater-Deckard & Scarr, 1996). Therefore, it is possible that the Difficult Child subscale may be elevated, while the Parent Distress subscale may not be elevated among parents of older children. These differences may result in misleading total stress scores causing researchers and clinicians to ignore possible differential effects of parenting stress on parenting behavior. Parent behavior may be different depending on whether parents attribute their stress to personal factors or to their children's behavior, especially when there are developmental differences in their children's behavior. The information clinicians gather from the PSI-SF should be interpreted carefully, taking into account the support, or lack thereof, for the validity of its subscales, and the results should be combined with a variety of other pieces of information before family intervention decisions are made.

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