

A RELIABILITY AND VALIDITY STUDY OF
THE PROTECTIVE FACTORS SURVEY
TO ASSESS PROTECTIVE FACTORS IN FAMILIES

By

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Table of Contents

List of Tables.....	vii.
List of Figures.....	ix.
Acknowledgements.....	x.
Abstract.....	xvi.
Chapter 1: Introduction.....	1
The Problem of Child Maltreatment.....	2
History of prevention.....	8
Prevention and parent education programs.....	11
Parent education research.....	12
Risk and protective factors and limitations of the literature.....	14
Limitations of a risk perspective and potential of a protective factors perspective.....	16
Reframing Prevention: Strengthening Families and the Protective factors... ..	19
Instrument review.....	27
Limited inclusion of protective factors and population fit	30
Lengthy administration and qualifications of administrator.....	30
The Development of the Protective Factors Survey.....	31
Alignment with Center for the Study of Social Policy protective factors... ..	33
The protective factors literature review.....	35
Family functioning.....	35
Social support.....	36

Concrete support.....	37
Nurturing and attachment.....	38
Knowledge of parenting and child development.....	39
Revision of the CSSP protective factors.....	40
Purpose of the Study.....	42
Research Questions and Hypotheses.....	44
Chapter 2: Research Methodology.....	46
Procedure.....	46
Participants.....	48
Measures—The Protective Factors Survey	53
Development of the PFS.....	53
Phase I.....	53
Phase II.....	54
Phase III.....	59
Phase IV.....	62
Limitations.....	67
Analytic Strategy.....	68
Power.....	68
Data preparation and screening.....	68
Normality.....	69
Missing data.....	69
The research design.....	71

Structural equation modeling (SEM)	71
Confirmatory factor analysis (CFA).....	72
Structural model.....	77
Goodness of fit.....	80
The Research Questions and Models.....	80
Chapter 3: Results.....	84
Sample.....	84
Examination of Normality.....	88
The Measurement Model (CFA).....	91
Question 1: To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?.	93
Hypothesis 1: The manifest variables will load highly on the appropriate factors.....	93
Summary.....	94
Question 2: What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)?.....	96
Hypotheses 2a: Family functioning and social support will be highly positively correlated.....	96
Summary.....	97
Hypothesis 2b: Social support and concrete support will be positively moderately correlated.....	97
Summary.....	97
Hypothesis 2c: Social support and nurturing and attachment will be highly positively correlated.....	97
Summary.....	98

Question 3: To what extent does the underlying structure of the PFS remain stable across time?	98
Hypotheses 3a: The factor loadings for each construct will remain stable across time.....	99
Summary.....	100
Hypothesis 3b: The relationships between the constructs will remain stable across time.	102
Summary.....	102
Hypothesis 3c: Latent mean scores will differ from Time One to Time Two.....	103
Summary.....	106
Question 4: What is the internal consistency of the items in each of the subscales?	106
Hypothesis 4: Internal consistency for each subscale will exceed a Cronbach alpha of .8.....	107
Summary.....	107
Additional Analyses: The Structural Model.....	108
Chapter 4: Discussion And Conclusions.....	110
Context.....	110
Brief Summary.....	111
Discussion.....	115
Question 1: To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?..	115
Hypothesis 1: The manifest variables will load highly on the appropriate factors.....	116
Question 2: What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)?.....	118

Hypotheses 2a: Family functioning and social support will be highly positively correlated.....	119
Hypothesis 2b: Social support and concrete support will be positively moderately correlated.....	120
Hypothesis 2c: Social support and nurturing and attachment will be highly positively correlated.....	122
Question 3: To what extent does the underlying structure of the PFS remain stable across time?	124
Hypotheses 3a: The factor loadings for each construct will remain stable across time.....	125
Hypothesis 3b: The relationships between the constructs will remain stable across time.	126
Hypothesis 3c: Latent mean scores will differ from Time One to Time Two.....	127
Question 4: What is the internal consistency of the items in each of the subscales?	129
Hypothesis 4: Internal consistency for each subscale will exceed a Cronbach alpha of .8.....	130
Limitations.....	131
Implications for Practice.....	133
Future Research.....	136
References.....	140
Appendices.....	165
Appendix A: Participant Organizations in the Development of the Strengthening Families Protective Factors.....	166
Appendix B: Protective Factors Survey User Manual.....	169

Appendix C: The Protective Factors Survey.....	195
Appendix D: MPlus Syntax	200

List of Tables

Table 1. Strengthening Families’ Protective Factors and Definitions.....	22
Table 2. Instrument Review.....	28
Table 3. Alignment of CSSP and PFS Constructs.....	41
Table 4. Agency and Number of Participants.....	49
Table 5. Demographic Characteristics.....	51
Table 6. Correlations between PFS Subscales and Validation Scales.....	58
Table 7. Time One – Time Two Correlations of PFS Factors.....	61
Table 8. Time One PFS – Time Two Criterion Scale Correlations.....	62
Table 9. Research Design.....	71
Table 10. Constructs, Operational Definition, & Expected Items to Load.....	74
Table 11. Research Questions, Model, and Explanation.....	83
Table 12. Comparison of Completers and Non-Completers on Pre Test.....	85
Table 13. Comparison of Completers and Non-Completers on PFS Scale Scores.....	88
Table 14. Descriptive Statistics for the PFS Items Included in the Confirmatory Factor Analysis.....	90
Table 15. Fit Indices.....	92
Table 16. PFS Items and Factor Loadings.....	94
Table 17. Time One – Time Two Correlations of PFS Factors.....	98
Table 18. Measurement Invariance: PFS Items and Equated Factor Loadings.....	101
Table 19. Measurement Invariance: Equated Correlations at Time One and Time Two....	103
Table 20. Measurement Invariance: Equated Latent Means.....	104

Table 21. Comparison Time One to Time Two PFS Scale Scores.....	106
Table 22. Structural Model.....	109

List of Figures

Figure 1. Ecological Model and Risk and Protective Factors.....	4
Figure 2. One Group Longitudinal CFA with All Parameters Estimated (including residuals).....	76
Figure 3. Structural Model.....	79

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Abstract

Child maltreatment results in long term adverse consequences for victims and poses significant costs to society. Prevention programs are reframing maltreatment and focusing on protective factors in addition to risk factors. Easy-to-administer, affordable, and psychometrically sound instruments that measure multiple protective factors are lacking. The present study explored the reliability and validity of the Protective Factors Survey (PFS), a tool developed to measure protective factors in parents and caregivers. Confirmatory factor analyses were conducted with a sample of 1,078 participants, who completed a parent education program in Nevada. Results provide psychometric data that support a valid and reliable four-factor solution, consisting of family functioning, social support, concrete support, and nurturing and attachment. The present study contributes to the knowledge base of protective factors and has implications for the field as a paradigm and tool for evaluation and research.

Chapter 1: Introduction

The existence of child maltreatment has been documented throughout history and across cultures. In the 21st century, the American public and policy makers agree that child maltreatment is an unpalatable social ill. Although it is difficult to isolate a specific reason, rates of maltreatment appear to be declining. Recently, the field of prevention began to reframe prevention and has developed a strengths-based approach that focuses on protective factors. At present, however, there are no brief instruments that measure multiple protective factors specific to the Strengthening Families approach, which has been at the forefront of the reframing movement. This study addresses that need by adding to the reliability and validity evidence of a promising instrument that measures multiple protective factors.

Three interrelated problems are discussed in the Introduction to provide context for the study—child maltreatment itself, a traditional focus on risk rather than protective factors, and a lack of valid and reliable instruments to measure protective factors in parents and caregivers. The first section describes the problem of maltreatment along with prevention approaches, specifically parent education. Risk and protective factors are discussed, and the case is made for focusing on protective factors, rather than risk factors only. The second section describes the Strengthening Families approach that is built around five protective factors, each of which has an evidence base supporting them. While the approach resonates with the prevention field, there is a need for more research and evaluation on the approach itself to increase protective factors within families or on the combination of the protective

factors to reduce child maltreatment. One potential cause for this is the dearth of psychometrically-sound instruments to measure protective factors. A review of available instruments and their limitations is provided along with a rationale for the need for a brief instrument that measures multiple protective factors. The third section describes the development of the Protective Factors Survey. The last sections of this chapter describe the present study and research questions to assess the validity and reliability of the Protective Factors Survey with a large sample of participants in parent education programs.

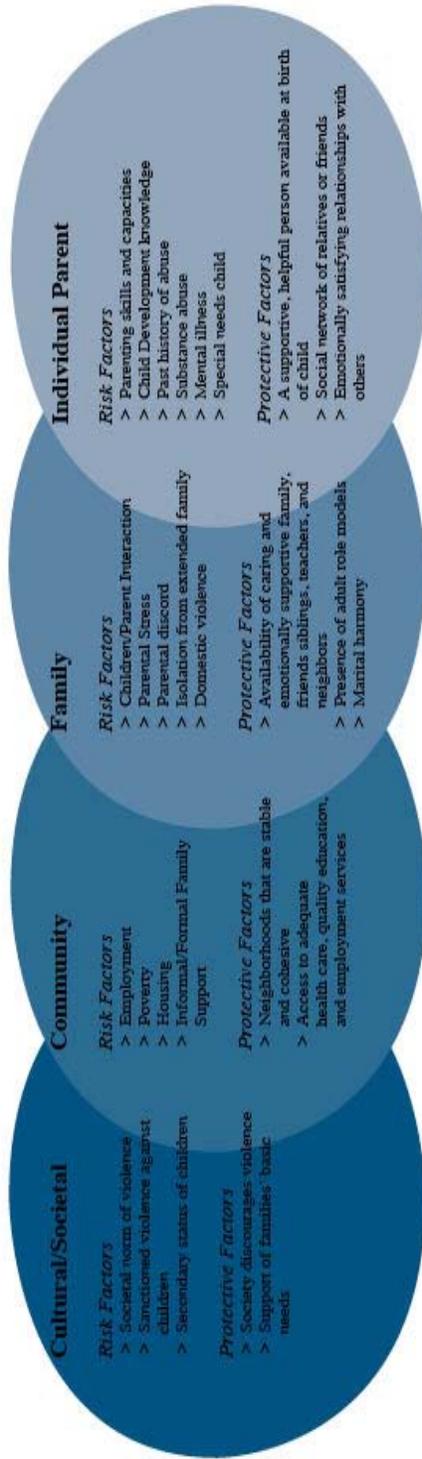
The Problem of Child Maltreatment

Child maltreatment is defined as “an act or failure to act which results in significant harm or risk of harm to a minor” (North Carolina Institute of Medicine, 2005, p. 2). There are four types of child maltreatment: physical abuse, neglect, sexual abuse, and emotional/psychological abuse. The ecological perspective, which provides an integrative theory of the etiology of child maltreatment, is the most widely used in the child maltreatment field, acknowledges multiple causes of maltreatment, and offers a framework to systematically address interrelated causes (Belsky, 1980; Center for Disease Control 2007; Dahlberg & Krug, 2002). The model encompasses four levels—individual, family, community, and societal (Belsky, 1980; Center for Disease Control 2007). Accordingly, child maltreatment is a result of complex interactions of protective and risk factors at the child, family, community, and societal levels. On each level, risk factors increase the likelihood of abuse, and protective factors insulate individuals and families from stress and

mitigate negative influences (National Research Council: Panel on Research and Child Abuse and Neglect, 1993). A more detailed discussion of risk and protective factors in the prevention of maltreatment and measurement of effectiveness is presented later. Figure 1 shows the ecological model with risk and protective factors at each level.

Figure 1

Ecological Model and Risk and Protective Factors (North Carolina Institute of Medicine, 2005)



The factors included in the model above are typically grouped as either risk factors or protective factors.

- > Risk factors increase the likelihood of negative outcomes occurring.
- > Protective factors are those characteristics that protect individuals or families from stress and other negative influences, and increase the likelihood of positive outcomes occurring.

Adverse consequences for maltreated children are well-documented and include minor injuries and permanent injuries such as burns, brain injuries, development delays, psychiatric disorders, and in the most severe cases—death (Runyan, Wattam, Ikeda, Hassan, Ramiro, 2002). Trauma resulting from child maltreatment has long term consequences that impact the victim well beyond the maltreatment (Shonkoff & Phillips, 2004), including adverse health effects and behaviors such as smoking, alcohol and drug abuse, eating disorders, obesity, depression, suicide, sexual promiscuity, and certain chronic diseases (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & James, 1998). Exposure to adverse childhood experiences, which includes child maltreatment, chaotic early environments, and premature death of a family member, can also result in premature death, reduce life expectancy, and contribute to an intergenerational cycle of risk factors (Anda, Dong, Brown, Felitti, Giles, Perry, Valerie, & Dube, 2009).

In addition to the human costs, child maltreatment also imposes significant financial costs on society, with total annual costs exceeding \$104 billion (Wang & Holton, 2007). Direct costs to society in 2007 were estimated at \$33 billion per year, which includes the associated costs of maintaining a child welfare system, to include judicial, law enforcement, health, and mental health services. Indirect costs to society are those associated with the long term adverse effects of child maltreatment, such as juvenile and adult criminal activity, mental illness, substance abuse, and domestic violence. Other consequences include loss of productivity due to unemployment and underemployment, the costs of special education services, and

increased use of health care. These other costs are estimated to be more than \$71 billion per year. Compared to these billions of dollars, federal expenditures specifically for child maltreatment prevention programs funded under the Child Abuse Prevention and Treatment Act, Title II, total \$42 million annually (M. Brodowski, personal communication, September 4, 2009). Cost benefit analyses on prevention programs found that for every dollar invested in prevention, a range of 19 to 34 dollars could be saved on the treatment and long term consequences of child maltreatment (Caldwell, 1992; Caldwell & Noor, 2003.) Because child abuse prevention generates such a substantial return on investment, it is important to identify and promulgate those programs and practices which achieve positive outcomes.

Other federal agencies also fund activities that may support child maltreatment prevention although not designated specifically for that purpose. The Maternal and Child Health Bureau (2008) launched the Early Childhood Comprehensive Systems program in 2003 for states to create an early childhood system integrating funding, services, and decision-making around five goals—health, social and emotional development, early care and education, parent education, and family supports. The grant’s intent is to overcome funding and delivery silos to provide families with coordinated resources to foster positive outcomes in young children. These goal areas address many of the risk and protective factors associated with child maltreatment.

To support research on child abuse and neglect prevention, the Centers for Disease Control (CDC) Injury Research Agenda (2009) identified five priorities for the period 2009 to 2014: 1) explore the context of child maltreatment to identify modifiable risk and protective factors, 2) identify and quantify the social and economic burden of child maltreatment, 3) evaluate the effectiveness of parent-focused strategies to prevent child maltreatment, 4) evaluate public and organizational policies to prevent child maltreatment, and evaluate the dissemination and implementation of evidence-based practices to prevent child maltreatment (CDC, 2009).

The encouraging news is that substantiated cases of child maltreatment are on the decline. While prevention programs cannot be directly tied to population changes in maltreatment rates, trends confirm that maltreatment is decreasing. In 2007, 794,000 children were maltreated, which is a decrease from 12.5 children per 1,000 in 2001 to 10.6 children per 1,000 in 2007. The Fourth National Incidence Study (NIS-4: Sedlak, Mettenburg, Basena, Petta, McPherson, Green, & Li, 2010) also confirmed this downward trend (The study's methodology is described in more detail in the following paragraph.) According to the NIS-4 (study year 2005-2006), over 1.25 million children were maltreated in the United States, which represents one of every 58 children. Although still unacceptable, this number represents a 19 percent decrease in the incidence of all types of maltreatment since the Third National Incidence Study in 1993 and returns incidence rates to those of the Second National Incidence Study in 1986 (Sedlak, et al., 2010).

Children under the age of four continue to be the most vulnerable and account for 76 percent of maltreatment fatalities (National Child Abuse and Neglect Data System: NCANDS, 2008), suggesting that prevention services in the early years are critical. However, rates of substantiated cases of child maltreatment should be interpreted with caution for several reasons. First, the National Incidence Study-4, a mandated study of the incidence and prevalence of child maltreatment under the Keeping Children Safe Act of 2003 (H.R. 14--108th Congress: Keeping Children and Families Safe Act of 2003), assumes that cases investigated by Child Protective Services (CPS) are the “tip of the iceberg.” Based on this assumption, the study’s methodology relies on sentinels—professionals who work with children—to identify children who may have been maltreated during the study period who would otherwise not be identified by CPS. This method enables an unduplicated count of maltreated children and identifies cases that might not be reported to CPS (Sedlak, Gragg, Mettenburg, Ciarico, Winglee, Shapiro, Hartge, Li, Greene, McPherson, 2008). Second, the majority of child abuse goes unreported. For example, in a survey conducted in North Carolina, mothers reported using harsh punishment 43 times higher than the child abuse rate (Runyan, et al., 2002). Finally, definitions of child maltreatment vary by jurisdiction, therefore are not a uniform indicator of child maltreatment nationally (Ross & Vandivere, 2009).

History of prevention. Prior to the 1970’s, few policies focused on child maltreatment as a social problem. The Child Abuse Prevention and Treatment Act was passed in 1974 largely in response to a study by Dr. Henry Kempe (1962), which

revealed that many childhood injuries thought to be caused by accidents were actually instances of child abuse. Title II of CAPTA, entitled the Community-Based Grants for the Prevention of Child Abuse and Neglect (CBCAP), was the first federal child maltreatment prevention program funding stream and emphasizes community-based efforts to strengthen families and prevent maltreatment (U.S. Congress, 1973).

Prevention programs proliferated in the 1980s in response to a 24 percent increase in reported child maltreatment rates in the mid-1970s (National Study on Child Abuse and Neglect Reporting, 1977) and the presence of the CBCAP funding stream.

Prevention evolved beyond educating mandated reporters and focusing on parenting deficiencies to include community-based strategies such as parent education programs and self-help groups (Grazio, 1981).

In 2003, CAPTA was reauthorized as the Keeping Kids Safe Act of 2003 (H.R. 14--108th Congress: Keeping Children and Families Safe Act of 2003). Under this reauthorization, CBCAP remains the largest federal funding stream for community-based prevention programs. Prevention advocates and individual programs will testify to the importance of community-based prevention activities. However, CBCAP has not demonstrated effectiveness according to federal standards because there has not been a rigorous national evaluation of the program. A lack of long-term outcome measures and rigorous program evaluation contributed to a “results not demonstrated” scoring from the Program Assessment Rating Tool (PART), a process developed by the U.S. Office of Management and Budget (2007) to assess and improve program performance.

While there is great interest on the national level to evaluate CBCAP activities, there is neither a federal mandate nor resources to conduct an extensive evaluation of the program as a whole. The funding itself poses extensive challenges for a national evaluation. Every state is awarded CBCAP dollars and has wide latitude to distribute the monies according to the legislated activities described below. Depending on the funding distribution on the state level, programs may have differing goals, objectives, and outcomes, making a unified evaluation difficult. The additional complexities of braided funding, program fidelity, and menu of services offered by community-based programs pose additional challenges for a national evaluation of CBCAP.

On the state and program level, many issues may impede the rigorous evaluation of prevention programs and could have contributed to CBCAP's effectiveness rating. Chief among these issues are lack of evaluation capacity and expertise (Tomison, 2000). Many community-based programs operate on tight budgets and do not have evaluation knowledge or capacity to conduct a program evaluation. Further, fragmented funding and the nature of the services themselves pose evaluation challenges. Many programs offer a continuum of services from which parents can select, making it difficult to attribute outcomes to any specific services (Knapp, 1995).

CBCAP legislation promotes a variety of service delivery models, encourages parent leadership of underrepresented groups, and requires public information activities, but does not include the types of performance or efficiency measures that

would allow for documentation of the federal investment in community-based programs. Home visitation, parent education, early intervention, family support, and public awareness campaigns are examples of activities funded by CBCAP (FRIENDS National Resource Center for Community-Based Abuse Prevention, 2007) and have been linked to reductions in child maltreatment. This study focuses on parent education.

Prevention and parent education programs. Parent education programs are one of many strategies to prevent child maltreatment. However, a strong link between parent education programs and child maltreatment rates is not well-established, perhaps due to ethical issues and to the difficulties of tracking program participants. For example, much of the survey research that has been conducted has been done with child protective service populations. The service mandate for this population makes experimental designs that use control or “no treatment” groups unattainable (Ammerman, 1998). Another reason for the missing link between parent education programs and a reduction in child maltreatment is the lack of valid and reliable measures of the incidence of child maltreatment in modest-sized programs for at-risk families that are not involved in the child welfare system (Ross & Vandivere, 2009). While large-scale studies such as the National Incidence Study of Child Abuse and Neglect have developed valid and reliable methods to assess the incidence of maltreatment for the population on a large scale, this methodology is not appropriate for small to moderate-sized evaluations (Ross & Vandivere, 2009). For that reason, indicators, which are a number that measures a concept, are often used to

assess program efficacy. Indicators can measure primary outcomes such as maltreatment or intermediate effects such as reductions in risk factors or increases in protective factors. When selecting indicators, practitioners and researchers should select indicators that are culturally-sensitive, easily understood, interpretable, and have wide acceptance by the field, decision makers, and researchers (Ross & Vandivere, 2009).

Parent education research. The following section provides a synthesis of parent education research. Four meta-analyses, a combined total of almost 200 primary and secondary prevention programs with some overlap, report consistent, moderate effect sizes.

MacLeod and Nelson (2000) used meta-analytic techniques to determine program effectiveness of 56 programs to promote family wellness and prevent child maltreatment. Family wellness was defined as the “presence of supportive, affectionate and gratifying parent-child relationships and a stimulating home environment that is conducive to positive child development” (p. 1129). Programs ranged from promotion of wellness at one end to intervention for reoccurrence of maltreatment at the other. The overall effect size was .41, suggesting that proactive and reactive approaches achieved better outcomes than 66 percent of the control/comparison groups.

Lundahl, Nimer, and Parsons (2006) conducted a meta-analysis of 23 studies to determine the effectiveness of parent training programs to reduce the risk of child maltreatment and the effect of moderators to influence outcomes. The outcomes

were parents' emotional adjustment, child-rearing attitudes, child-rearing behaviors, and documented abuse. Standardized measures were used in each of these areas.

Overall, parenting program results showed moderate effects ($d=.45-.60$) and significant, positive gains in all areas. Conclusions suggest that parent training programs were effective in reducing risk factors of maltreatment.

Geeraert, Noortgate, Grietens, & Onghena (2004) searched an international database for studies between 1975-2002 on selective prevention programs for at risk families. Included studies focused on decreasing maltreatment risk by having a positive effect on the child's functioning, parent-child interaction, parent's functioning, family functioning, and the family context (socioeconomic and social network). The overall effect size was estimated to be .29, and provides evidence that prevention programs to reduce maltreatment generally have a positive effect on the proxy variables mentioned above.

The Centers for Disease Control and Prevention conducted a meta-analytic review to determine what specific components of parent training programs yield the largest effect sizes (Kaminski, Valle, Filene, & Boyle, 2008). Seventy-seven published evaluations of parenting training to prevent or minimize early childhood behavior problems were selected. Effect sizes ranged from .13 to .88 with a significant overall effect size similar to those found in the above referenced meta-analyses. The effect sizes of parent outcomes (knowledge of parenting, attitudes, behavior, and self-efficacy) were larger than child effect sizes. Program components related to positive parent behavioral outcomes were opportunities to practice skills

with their child, positive parent-child interactions and emotional communication, and positive discipline techniques. Program elements consistently associated with smaller effect sizes were a focus on problem solving and communication, the parental promotion of cognitive and academic outcomes, and ancillary services.

Risk and protective factors and limitations of the literature. The terms risk and protective factors describe conditions under which problems thrive and wither (Fraser, Richman, & Galinsky, 1999). Risk is the probability of a future event occurring given a certain set of conditions. Risk factors are causes or markers of the problem. As the number of risk factors increases, so does the likelihood of the problem. Protective factors are the opposite of risk factors, also predict future outcomes, and modify or buffer risk factors (Rutter, 1987).

Most parent education programs target attitudes and behaviors known to reduce the risk of maltreatment. Participation in these programs has been linked to improved emotional well-being, changed parent beliefs about corporal punishment as an effective discipline technique, more realistic expectations for children, and increased skills to communicate and interact with children (Geeraert, et al., 2004; Lundahl, Nimer, & Parsons, 2006; Repucci, Britner, & Woolard, 1997; MacLeod & Nelson, 2000; Kaminski et al., 2008; Thomas & Zimmer-Gembeck, 2007). Although not specifically described in this manner, these reductions in risk factors often indicate an increase in protective factors.

The limited research on the effectiveness of parent education programs to increase protective factors has narrowly focused on family functioning and

knowledge of child development with less attention on social and concrete support and nurturing and attachment. Although Geeraert, et al. (2004) described outcomes as reductions in risk factors, the increases in parent functioning and family functioning and improvements in the family context could be considered protective factors. Kaminski et al. (2008) did not specifically mention protective factors, however problem solving and communication are components of family functioning. MacLeod & Nelson's (2000) review on family wellness included social and concrete support as moderator variables or components of programs, but not as outcomes. Interestingly, as a moderator variable, programs that included social support and concrete support as program components resulted in lower effect sizes. A possible explanation is that the presence of a social network may result in more observation and reporting of child maltreatment.

In a systematic review of the literature on maltreatment from 1980-2004, 188 studies were explored to identify gaps in prevention strategies and suggest future directions for implementation (Klevins & Whitaker, 2007). Only a few of these studies mentioned protective factors. In those that did, definitions and the exploration of protective factors were not consistent across the studies. Because of the inconsistent definitions and limited mention of protective factors in the 188 studies, protective factors were not a focus of the Klevins & Whitaker review.

The majority of studies on child maltreatment, including the meta-analyses of these studies, occurred prior to the development of the Strengthening Families (SF) approach and the movement to reframe the focus on protective factors, which are

described in detail below. The following section discusses why a focus on the protective factors is important and has the potential to move the field forward.

Limitations of a risk perspective and potential of a protective factors perspective. While the statistical techniques used to collect and analyze data on risk and protective factors are virtually indistinguishable from each other, a protective factors lens has the potential to overcome the limitations of a risk model and significantly alter the reach and potentially, the outcomes of child maltreatment prevention efforts. Prevention programs organized predominantly around risk schema may be imposing the following practice constraints that limit the impact of services.

First, selective prevention programs based on risk criteria engage a small segment of the population. Prevention programs such as home visitation, parent education, and family support programs serve approximately two million children under the age of five annually, which is approximately 11 percent of the 21 million children under the age of five (U.S. Census Bureau, 2008). For parents to be referred to and engaged in these programs, they have to acknowledge deficits or be court-mandated to participate in services. As a result, participating in a program based on a risk-model may be stigmatizing to parents and reduce participation in programs. The protective factors approach, on the other hand, may help overcome the stigma of participating in prevention programs. A more universal approach based on protective factors would enlarge the breadth of partners to include child care and early education programs and providers. While parents may be resistant to

acknowledging deficits or inadequacies in risk-focused programs, most parents, including those who utilize child care or early education programs, can relate to feeling overwhelmed at times and want to be better parents. They may be more open to and accepting of approaches that acknowledge and build on their strengths. Further, most parents have trusting relationships with the people who care for their children, so may be more likely to lean on them for support. A trusting relationship with non-threatening and accepting staff is more likely to engage parents (Oynskiw, Harrison, Spady, & McConnan, 1999; Toban & Lutzker, 2001) and result in higher levels of retention.

In summary, protective-focused models may engage larger numbers of children and families because of greater reach, less stigma, and strong relationships with providers. For example, over 12 million children under the age of six spend time in some type of child care or early education setting each week. The average time spent in these settings is 37 hours per week (National Association of Child Care Resource and Referral Agencies, 2009). By linking early care and education program with prevention programs, the number of children and families engaged in efforts to strengthen families could increase seven-fold to 14 million children, which is over two thirds of the population of children under the age of five (U.S. Census Bureau, 2008).

Second, in many practice settings, risk assessments are conducted at a static point in time, and services are based on the results. However, the child and the family constantly change. The family may develop risk factors that warrant different

or additional services from other agencies or systems (Sidebotham, 2001; Asawa, Hansen, & Flood, 2008). For example, a family screened at the birth of a child may not be at risk at this time. Changes in marital or employment status in the first year of the child's life may place stressors on the family that could be mitigated through parent education, home visitation, or other family supports. Until the family asks for help or is referred to child welfare, the family would go without services because they were at low risk when screened. A protective-factors approach that includes a larger tent of prevention partners could elongate the continuum of screening points and result in multiple entry points for families. Families would benefit from ongoing support of the provider and would be referred for more intensive services, if needed.

Third, risk factors are not always reliable as predictors of maltreatment. Many parents with multiple risk factors do not abuse their children, while the reverse is also true. That is, families with no identified risk factors maltreat their children (Ross & Vandivere, 2009). Studies of children at high risk for maltreatment found that the majority of parents who were abused or neglected as children do not maltreat their own children (Egeland, Bosquet, and Chung, 2002; Parker, Piotrowski, & Peay, 1987; Higgins, 1994). In a study of intergenerational violence, researchers found that protective factors distinguished individuals who repeated the cycle of violence from those who broke it (Dixon, Browne & Hamilton-Giachritsis, 2009). Therefore, a mixed model of prevention—including programs based on risk and universal protective factors—would be the most comprehensive method to reach parents.

Fourth, many risk factors such as low maternal age, maltreatment as a child, and marital status at child's birth, are static, therefore cannot be influenced by programmatic strategies (Ross & Vandivere, 2009). The protective factors identified by the Center for the Study of Social Policy (CSSP) in the following section, on the other hand, are malleable and can be addressed by a continuum of programming, including traditional prevention programs plus early care and education settings.

Finally, a focus on protective factors is consistent with the strengths-based perspective of social welfare and could increase the involvement of the field of social welfare in early childhood, support early intervention and a public health approach to child maltreatment, and potentially reduce the need for tertiary interventions for child maltreatment. Seeing prevention through a protective factors lens makes sense from a practice and research standpoint and has significant potential to increase the reach of prevention programs and contribute to reductions in child maltreatment. The following section describes an emerging, feasible, and appealing approach to promote protective factors in families in a variety of settings.

Reframing Prevention: Strengthening Families and the Protective Factors

In early 2003, Prevent Child Abuse developed a national reframing strategy to communicate and advocate on behalf of child prevention to shift the public perception about child maltreatment from a condition that will always be present in society to one that is preventable (Kirkpatrick, 2004). They partnered with the Frameworks Institute to better understand the public's frame of reference on child maltreatment. The Frameworks Institute began a research process that included a meta-analysis of

existing public awareness, understanding and opinion on child abuse from 1983 to 2003, one-on-one interviews with individuals exploring how people think about child maltreatment, six focus groups in three locations across the United States, analysis of marketing materials used by prevention advocates, and a news content analysis of media coverage of child abuse and neglect.

These research activities resulted in a final report and several working hypotheses for a strategic reframing of child maltreatment. In summary, the hypotheses found that public awareness of child maltreatment and an understanding of the root causes are high. When the public thinks about maltreatment, it is only about the most extreme cases. Less severe types of causes confuse the general public and are often attributed to accidents or circumstances beyond the parents' control. Although the general public wants to avoid judgment, there is little sympathy for abusive or neglectful parents. Parents, however, possibly as a defense mechanism to insulate themselves from judgment, acknowledge that parenting is a tough job. Despite the acknowledgement of parenting as a challenging job, parents are hesitant to ask for help. Finally, outside of reporting abuse to authorities, the public feels it has little power to do anything about child maltreatment either individually or systematically (Kirkpatrick, 2004).

Building on this work, the reframing movement continued to evolve by communicating that parenting is a difficult job and that all families need help. The movement has been largely influenced by the Strengthening Families Initiative (SFI) work of the Center for the Study of Social Policy (CSSP, 2004a), which reframed

child abuse and neglect prevention by using a strengths-based approach with early care and education programs. Funded by the Doris Duke Charitable Foundation, the CSSP was charged with the task of developing a systemic, high-impact primary prevention strategy that targeted children under the age of five and their families (Langford & Harper-Browne, in press). The intention was to identify a feasible approach to child maltreatment prevention that could be disseminated nationally, reach a large number of very young children and have impact long before abuse or neglect occurred. The guiding hypothesis was that early care and education programs could be a central point of influence because staff have daily contact with parents and children, have strong, intimate relationships with families, offer a universal approach to provide positive encouragement and education to families, and could provide an early warning and response system at the first sign of problems. The CSSP process involved four steps: 1) Conduct an extensive literature review to identify what factors reduce child maltreatment, 2) Explore the connection between factors that prevent maltreatment and what early childhood programs do to build them, 3) Identify programs that build the factors and learn how they do it, and 4) Learn about policy and practice changes needed to infuse the model statewide through a partnership with seven pilot states (CSSP, 2004b).

The CSSP Strengthening Families' literature review was conducted by the Erickson Institute and proposed five protective factors asserted to be linked, both conceptually and empirically, to a reduction in child maltreatment. The protective factors were: social support, concrete support in times of need, parental resilience,

knowledge of parenting and child development, and healthy social and emotional development of young children (CSSP, 2004a). Table 1 shows the original protective factors and definitions proposed by the CSSP.

Table 1

Strengthening Families' Protective Factors and Definitions

Protective Factor	Definition
Parental Resilience	The ability to cope and bounce back from all types of challenges
Social Connections	Friends, family members, neighbors, and other members of a community who provide emotional support and concrete assistance to parents
Knowledge of Parenting and Child Development	Accurate information about raising young children and appropriate expectations for their behavior
Concrete Support in Times of Need	Financial security to cover day-to-day expenses and unexpected costs that come up from time to time, access to formal supports like TANF and Medicaid, and informal support from social networks
Children's Social and Emotional Development	A child's ability to interact positively with others and communicate his or her emotions effectively

(CSSP, 2004a)

Input was gathered from the field through dialogue sessions at national conferences and in consultation with leaders at national child maltreatment prevention and early childhood organizations. The purpose of the dialogue sessions was to present the identified protective factors to the national organization leaders in the field of early childhood and child maltreatment prevention to determine if the protective factors: 1) are aligned with practitioners' experience, 2) would engage a variety of partners who were connected to families, and 3) are supported by the

research presented in the Erickson Institute literature review. In these sessions, participation ranged from groups of 10 to 100. Participant organizations included Community Based Child Abuse and Neglect Prevention Programs, Child Trends, Child Welfare League of America, Family Support America, Free to Grow, the National Alliance of Children's Trust Funds, the National Association of Education for Young Children, the National Association of Child Care Resource and Referral Agencies, the National Child Care Association, Prevent Child Abuse America, USA Child Care, and Zero to Three. (Descriptions of the participant organizations can be found in Appendix A.)

Information from the dialogue sessions was used to refine the protective factors framework, assess whether there would be the interest and energy to embrace this approach in the field, and start building a base of awareness and knowledge about the protective factors as a framework for thinking about child abuse and neglect prevention. The first step was to identify programs that already built protective factors in families and to document how they do so. A national study was designed to capture this process. Across the nation, 500 individuals from the fields of early childhood and child abuse and neglect prevention were asked to nominate exemplary early care and education programs that built protective factors in their day-to-day practice with children and families. Nominated programs were asked to fill out an extensive survey describing their work to build the protective factors described above, as well as to submit supplementary materials such as calendars of activities, curricula, resource materials for parents, and so on. One hundred child care and early care and

education programs responded to the nominations by filling out the survey and sending materials. Out of these, 25 were selected and received two-day site visits from CSSP. Programs reflected diversity in: region of country, program model and auspices, budget size, and target population. The site visits involved structured observation of pick-up and drop-off, focus groups with staff, parents, and community partners, interviews with the director and key staff members, and individual interviews with selected parents.

Based on the information collected, a number of tools were developed to support programmatic implementation of Strengthening Families in early childhood settings. The most important of these was a guidebook and self-assessment for early childhood programs. The guide and self-assessment provide specific areas of practice where an early childhood program can increase their capacity to build protective factors for families. These tools allow flexibility in implementation while creating a structured framework to guide Strengthening Families practice at the local level.

The next step in the development of the Strengthening Families Initiative was a two year pilot that enlisted states to create partnerships that would explore the policy, training, and capacity building framework needed to support program capacity to build protective factors. States participating in the pilot received no additional funds, only technical assistance and support. To qualify for the pilot, states had to demonstrate collaboration between the early childhood, child abuse and neglect prevention, and child welfare sectors (as demonstrated in shared submission of the

proposal) and to have developed an initial implementation plan. The response from states was surprising. Forty-three states expressed interest, 27 states applied and, finally, seven were selected (Alaska, Arkansas, Illinois, Missouri, New Hampshire, Rhode Island and Wisconsin). CSSP offered technical assistance, provided tools for the promotion of Strengthening Families, coordinated cross-site learning, and documented lessons learned. Throughout the two year period, the pilot states developed new tools and materials to promote the protective factors, tested implementation strategies, and shared knowledge through a learning network. The evaluation of the pilot project used mixed methods to document “hallmarks” or evidence of diffusion strategies of Strengthening Families rather than programmatic outcomes. In other words, the evaluation identified the pilot states’ ability to implement the approach. Effectiveness of implementation strategies to increase protective factors was not addressed (CSSP, 2004b).

Several points of influence to implement sustainable systems change were identified: parent partnerships, state infrastructure, professional development, early childhood systems building, and child welfare linkages (Langford & Harper-Browne, in press). It became evident that Strengthening Families had utility beyond a universal approach limited to early care and education, a reach that greatly exceeded the expectations of the developers. Today, Strengthening Families has a presence in all 50 states and serves as a guiding framework for Community-Based Child Abuse and Neglect Prevention programs, child welfare systems, Head Start, family child care homes, afterschool programs, and state and community prevention plans

(Langford & Harper-Browne, in press; National Alliance of Children's Trust Funds, 2009). The protective factors framework resonates with a much wider audience than a risk model and multiplies the number of stakeholders who work with families to prevent maltreatment.

Despite this broader reach, Strengthening Families has its limitations. It is important to clarify what Strengthening Families is and is not. Strengthening Families is an approach with the end goal of increasing protective factors in families to prevent child maltreatment. Strengthening Families is not an evidence-based model with clearly defined implementation elements. Strengthening Families can be integrated into existing programs. Programs subscribing to the approach may utilize differing strategies, resources, and partners. The flexibility of the approach is attractive to many in the prevention field because it builds on existing strategies, is easily understandable, and also translates well to parents (Strengthening Families Illinois, 2007). Nationally, all 50 states are implementing or integrating the Strengthening Families approach in some manner as a primary prevention child maltreatment strategy (National Alliance of Children's Trust Funds, 2009). Despite this broad uptake of the protective factors' philosophy, there remains a gap in the research to document its effectiveness to increase protective factors in families, and ultimately lead to a sustainable reduction in child maltreatment.

The inclusiveness of the approach leads to an elusiveness when attempting to document the quantity of Strengthening Families within a program. Although the SF guidebook and self-assessment suggest strategies to strengthen families, the lack of a

program implementation guide does not allow for measures of fidelity. Therefore, while there is theoretical support for the protective factors, questions remain about the quantity of SF and combination of strategies necessary to affect change. Finally, it remains to be seen whether adding Strengthening Families to an evidence-based program creates an additive or dilutive effect on outcomes.

One of the first needs to answer the aforementioned questions and build an evidence base for the Strengthening Families approach is a way to measure the protective factors as specified by CSSP. The following section provides a review of instruments developed prior to the Strengthening Families initiative and demonstrates the need for an instrument that measures multiple protective factors that align with the Strengthening Families approach.

Instrument review. A review of 59 instruments included in the FRIENDS Compendium of Annotated Measurement Tools (FRIENDS National Resource Center, 2008) was conducted by the researcher to identify instruments that measure protective factors against child maltreatment. FRIENDS, the National Resource Center for Community-Based Child Abuse and Neglect Prevention Programs (CBCAP), provides technical assistance to the state lead agencies that receive CBCAP funding. The purpose of their Compendium was to assist programs funded under CBCAP with evaluation plans by providing them with annotations of tools used to measure prevention outcomes. The Compendium is comprised of instruments used by community agencies to document prevention outcomes. To be included in this researcher's review, tools had to measure one or more protective factors, focus on

the parents/caregivers, and demonstrate validity and reliability. Table 2 shows the 10 valid and reliable self-report instruments for parents, caregivers, or families that met the inclusion criteria and measured at least one of the CSSP protective factors.

Table 2

Instrument Review

Instrument	Psychometrics	Domains
Coping Health Inventory for Parents (McCubbin, McCubbin, Patterson, Cauble, & Warwick, 1983)	Internal Consistency: Subscale 1: 0.79; Subscale 2: 0.79; Subscale 3: 0.71	Child Health, Parenting a child with Special Needs, Formal and Informal Sources of Support, Parent & Family Resiliency
Family Adaptability and Cohesion Evaluation Scale (Olson, Gorall, & Tiesel, 2004)	Internal Consistency: Disengaged :0.87; Enmeshed: 0.77; Rigid: 0.83; Chaotic : 0.85; Balanced Cohesion: 0 .80; Balanced Flexibility: 0 .80; Validity: 0.91-.93	Family Relationships
Family Assessment Form (McCroskey, Sladen, & Meezan, 1997)	Construct Validity: 0.63; Inter-Rater Reliability: 75-80 percent; Inter-Item Reliability: 0.68-.90	Child & Family Health, Family Relationships, Parenting, Sources of Support
Family Environment Scale (Moos & Moos, 1983)	Internal Consistency: 0.61-.78 (manual reports) & 0 .31-.72 (Boyd Study)	Child & Family Health, Formal & Informal Sources of Support & Community Involvement, Family

		Relationships
Family Needs Scale (Dunst, Trivette, & Deal, 1988)	Internal Consistency: 0.77, Split-Half: 0.75; Test-Retest: 0.75 (scale items), and 0.91 (total scale scores)	Formal & Informal Sources of Support
Family Resource Scale (Dunst, Trivette, & Deal, 1988)	Internal Reliability: 0.92; Split-Half: 0.95; Test-Retest: 0.52; Concurrent Validity: 0.57 & 0.63	Formal & Informal Sources of Support & Involvement
Inventory of Socially Supportive Behaviors (Barerra, Sandler, Ramsay, 1981)	Reliability: 0.90; Internal Consistency: 0.93-0.94, Test-retest reliability: 0.63 to 0.88	Formal & Informal Sources of Support, Parent Resiliency
Knowledge of Infant Development Inventory (MacPhee, Fritz, & Miller-Heyl, 1996)	Internal Consistency: 0.67 (pre-test), 0.55 (post-test) in college students; 0.82 for parents; .50 for professionals	Parenting Skills, Child Development
North Carolina Family Assessment Scale-General (Reed-Ashcraft, Kirk, R. & Fraser, 2001)	Cronbach's Alpha: .71-.94	Formal & Informal Sources of Support & Involvement, Family Relationships, Parenting Skills, Child & Family Health
Parent-Child Relationship Inventory (1988)	Internal Consistency: 0.82; Test-Retest: 0.81	Parent Attitude toward parenting and toward their children

To expand the research base on protective factors, there must be valid and reliable instruments that measure multiple protective factors. While the instruments

reviewed met the inclusion criteria and measured protective factors against child maltreatment, they do not meet the need of community-based agencies for easy-to-administer and affordable instruments, nor do they measure multiple protective factors as described by CSSP. Limitations of the instruments are discussed below.

Limited inclusion of protective factors and population fit. These instruments, as a whole, are valid and reliable and assess such constructs as concrete support, coping, flexibility, family cohesion, problem solving and communication, social/emotional support, family functioning, and knowledge of infant development. However, none of the measures provides an assessment of multiple protective factors in one easily-administered instrument. Community-based agencies interested in measuring multiple protective factors against child maltreatment would have to use several measures. Such an endeavor could become costly and time prohibitive. Further, some instruments such as the Coping Health Inventory (McCubbin et al., 1983) were designed for specific populations such as children with special needs. Finally, many of the instruments measure the source, quantity, and quality of support. This is problematic because it is the perception rather than the aforementioned attributes of support that is important as a predictor of child maltreatment (Belsky, 1993; Egeland, et al., 2002).

Lengthy administration and qualifications of administrator. Some measures present additional barriers for use by community-based agencies. For example, the Family Adaptability and Cohesion Evaluation Scale (FACES IV) is a 42-item, self-report instrument with six scales that is used to measure family cohesion

and flexibility (Olson, et al., 2004). The scales demonstrate adequate reliability. This measure, however, requires specific training and education in order to administer the survey—a minimum of a master’s degree—that may pose challenges for community-based programs, particularly in rural areas with a scarcity of agency staff with advanced degrees. The Family Assessment Form (FAF) is also a six-scale instrument with adequate reliability (McCroskey, et al., 1997). The scales are administered by a home visitor or family support worker over three to four contacts with the family. The administration time of more than one hour may make it difficult for community-based programs with limited staff resources.

The Development of the Protective Factors Survey

The focus on protective factors is gaining momentum as a necessary and productive approach to child maltreatment prevention because protective factors benefit all families, help build positive relationships with service providers, and draw on natural support systems that contribute to long-term success (Child Welfare Information Gateway, 2009). Nationally, CBCAP and national partner organizations, including BUILD: Strong Foundations for Children, FRIENDS, the National Association for the Education of Young Children, the National Alliance of Children’s Trust and Prevention Funds, the National Child Care Information and Technical Assistance Center, United Way, and Zero to Three have endorsed the Strengthening Families approach and are integrating it into their work (Strengthening Families, 2009). The adoption of the approach by both national organizations and prevention programs on the state and community level warrants a need for tools to

measure multiple protective factors in families. As mentioned earlier, it is critical to document the Strengthening Families approach's effectiveness to increase protective factors in families and ultimately lead to a sustainable reduction in child maltreatment. The following section describes the development of the Protective Factors Survey (PFS) and this researcher's involvement in the development and subsequent testing of the PFS.

Three factors contributed to this researcher's involvement with the PFS: 1) national interest in Strengthening Families and the protective factors, 2) the researcher's participation in the CBCAP Program Assessment Rating Tool (PART) workgroup, and 3) the researcher's interest in evaluating and conducting research on prevention.

At the annual CBCAP conference in 2006, CSSP presented on the Strengthening Families Initiative and the protective factors. The approach was endorsed by CBCAP, and states were encouraged to incorporate the approach into prevention frameworks. During the same time period, the researcher was a member of the CBCAP Protective Factors Survey Subcommittee. This group was formed in response to the inconclusive rating of CBCAP through the PART process, as described earlier. This subcommittee was charged with making recommendations on a data collection process that would document how currently-funded programs increase protective factors. Program staff led by Donna Norris at the Texas Department of Health and Human Services proposed the development of a brief survey tool that would measure multiple protective factors. The CBCAP

subcommittee, under the leadership of FRIENDS staff Casandra Firman, proposed a set of items that could be used as a tool to measure protective factors. Because of an interest in research and survey development, this researcher suggested that the psychometric properties of the PFS be examined before the tool was widely distributed. The group concurred and the testing of the PFS began and is described fully in the methods section.

Alignment with Center for the Study of Social Policy protective factors.

Because of the national interest in and adoption of the SF approach, it was important for the Protective Factors Survey to align with the CSSP protective factors to the extent possible. Three of the CSSP protective factors—social connections, concrete support in times of need, and knowledge of parenting and child development—correspond directly with the PFS (See definitions in Table 3.) Differences between the CSSP model and this study are the conceptualization of parental resilience, the addition of nurturing and attachment, and the absence of children’s social and emotional competence.

Parental resilience was originally defined by the CSSP as “the ability to cope and bounce back from all types of challenges” (CSSP, 2004a). Definitions of resilience include adaptation to extraordinary circumstances and positive outcomes in the face of diversity (Fraser, Richman, & Galinsky, 1999), a process that results in positive coping in the face of adversity (Gilligan, 2004), the ability to bounce back from negative emotional experiences, and to be flexible and adaptive in stressful situations (Tugade & Fredrickson, 2004). Resilience has been characterized by three

strands of successful functioning—overcoming the odds, sustaining competence under pressure, and recovering from trauma. Strengthening Families is a primary prevention strategy that occurs prior to maltreatment, therefore the authors of the PFS focused on the malleable components of resilience—overcoming the odds and sustaining competence under pressure. Further, it would be beyond the scope of a brief pre-post instrument to capture the number and types of stressful situations the parent was exposed to and their reactions and actual behaviors to overcome them. There is substantial research on the other strand—recovering from trauma and resilient children. Studies of children at high risk for maltreatment found that the majority of parents who were abused or neglected as children do not maltreat their own children (Egeland, Bosquet, & Chung, 2002; Parker, Piotrowski, & Peay, 1987; Higgins, 1994), suggesting that something occurred in the victims' lives to overcome the odds, maintain competence under pressure, or recover from the initial trauma (Fraser et al., 1999).

Because of the focus on malleable components, primary prevention, and needs of prevention programs for an easy-to-use instrument, the authors of the PFS decided to focus on family functioning and competencies associated with resilient adults—adaptive coping, problem solving (Hetherington & Blechman, 1996), and feelings of mastery about parenting. The research supporting family functioning is summarized below in the Protective Factors Survey literature review. Nurturing and attachment were also identified as a protective factor against child maltreatment in an additional literature review (Counts, Buffington, Chang-Rios, Rasmussen, &

Preacher, in press), which is described in the following section. The protective factor—children’s social and emotional competence—was not included in the PFS or this study because the focus is on increases in protective factors of parents and caregivers rather than children.

The protective factors literature review. This study and the PFS focus on protective factors that can be targeted for change in parents or caregivers. For that reason, only parental protective factors—family functioning, social support, concrete support, nurturing and attachment, and knowledge of parenting—are included in the literature review.

Family functioning. Family functioning is the well-being or performance of the family unit in such domains as relationships within the family (Geeraert, et al., 2004), health/ competence, conflict resolution, cohesion, leadership, and expressiveness (Beavers & Hampson, 1990). Research has shown that neglectful families show significantly lower levels of functioning than non-neglectful families (Gaudin, Polansky, Kilpatrick, & Shilton, 1996). Studies have also shown that assessments of family functioning—including structure, organization, cohesion, conflict management, and communication and corresponding interventions—can lead to improved parenting quality (Gaudin, et al., 1996). Further, a meta-analysis of 40 evaluation studies reported that parent education programs are effective at improving family functioning, thus reducing the risk of child maltreatment (Geeraert, et al., 2004). In the PFS, family functioning is operationalized as having adaptive skills and strategies to persevere in times of crisis. Manifest variables to measure family

functioning include items that tap adaptive coping, problem solving, and feelings of mastery about parenting and family.

Social support. The definition of social support is multi-faceted and includes structural components such as characteristics of a social network and functional aspects like emotional, instrumental, or informational support (Thoit, 1982; Cameron, 1990; Gottlieb, 1985; DePanfilis, 1996). Social support buffers against child maltreatment when members of the social network do not condone neglect and provides feedback that lets people know what is expected from them (Belsky, 1993; DePanfilis, 1996). Individuals who experienced abuse as a child were less likely to abuse if they perceived access to social networks (Belsky, 1993; Egeland, Bosquet, & Chung, 2002). In a study on intergenerational violence, social support was identified as a distinguishing factor between those who continued the cycle of violence and those who broke it (Dixon, Browne & Hamilton-Giachritsis, 2009).

Social networks, including family and non-family support, benefit families by providing parents with information on appropriate childrearing methods (Bronfenbrenner & Crouter, 1983; Moncher, 1995), moderating maladaptive parenting and stresses (Voight, Hans, & Bernstein, 1996; DePanfilis, 1996), and supporting positive environments for infants and children. On the other hand, abusive parents report limited access to informal support and dissatisfaction with the social networks they do have (Corse, Schmid, & Trickett, 1990; Coohy, 1996). Social networks are critical to maintain gains made by families after times of crisis or stress because these informal support systems are available to parents after formalized

services have ceased (Rzepnicki, 1991). It must also be noted that social networks can have negative effects and influences on parents (Korbin, Coulton, Chard, Platt-Houston, & Su, 1998; Hill, 2002). In the PFS, social support is operationalized as perceived informal support (from family, friends, and neighbors) that helps provide for emotional needs. Survey items measure the caregiver's perception of the availability of support from members in his/her network.

Concrete support. Concrete support consists of tangible resources, including food, cash, child care assistance, and clothing that social networks may provide as buffers against parenting stresses (Cochran & Niego, 1995). Stressors related to poverty can be overwhelming for families. Parents experiencing financial difficulties suffer from elevated levels of depression and, in turn, lower psychological functioning (Jackson, Brooks-Gunn, Chien-Chung, & Glassman, 2000). These elements contribute to less than optimal home environments and heightened parenting stress, increasing the likelihood of inconsistent, coercive, and punitive discipline (McLoyd, 1995; 1998; Cole & Cole, 1993).

Half of children living in poverty endure stressful home environments (Anderson-Moore & Vandivere, 2000). In a 1996 study, families living in poverty (\$15,000 annual income) were 22 times more likely to experience maltreatment than families making twice that income (Sedlak & Broadhurst, 1996). During the recent economic recession, reports of severe abuse and fatalities have spiked (Pratt, 2009). Concrete supports can moderate financial strain and lower risk factors for abuse. In the study on intergenerational violence mentioned above, financial solvency (concrete

support) was identified as the other distinguishing protective factor (in addition to social supports) between those who continued the cycle of violence and those who broke it (Dixon, Browne & Hamilton-Giachritsis, 2009). Poverty and a lack of resources are significant stressors to families and increase the likelihood of maltreatment. Prevention programs do not have the resources to make societal changes to address inequities; however, providing concrete or instrumental support is one avenue for programs to insulate parents against the consequences of poverty and lack of resources. In the PFS, concrete support was operationalized as access to tangible goods and services to help families cope with stress, particularly in times of crisis or intensified need. Items measure the awareness of, and opportunities for, parents to find and utilize concrete supports.

Nurturing and attachment. Early research on attachment explored aspects of infant behavior and also focused on the relationship between the child and caregiver (Ainsworth, Blehar, Waters & Wall, 1978). All infants develop some attachment to their caregivers; however, the quality and strength of this relationship varies. Researchers focus on the constructs of security, confidence, and trust to understand the “attachment security” between infant and caregiver (Shonkoff & Phillips, 2004). Maltreated children show lower quality attachment than non-maltreated children and exhibit higher rates of aggression, lower social competence, and less empathy (Crittenden, 1988; George & Main, 1979; Morton & Browne, 1998; Shonkoff & Phillips, 2004). Some argue that the window to establish quality attachments remains open during the early childhood years (Shonkoff & Phillips, 2004), offering

opportunities to develop and strengthen bonds between the child and caregivers. Prevention efforts such as home visitation focus on parent-child bonding and include strategies to strengthen early relationships (Olds, Robinson, O'Brien, Luckey, Pettitt, Henderson, Ng, Sheff, Korfmacher, Hiatt, & Talmi, 2002). The operational definition of nurturing and attachment is the emotional tie, along with a pattern of positive interaction between the parent and child that develops over time. Survey items explore how parents perceive the strength of the attachment with their child.

Knowledge of parenting and child development. Many parent education services have the goal of increasing knowledge of child development and management skills to manage child behaviors. While increasing knowledge of child development alone may not lead to changes in behavior, parenting programs may translate such knowledge into appropriate parenting skills that diminish the risk of abuse (Kaminski, et al., 2008). Most parent education programs target attitudes and behaviors thought to reduce the risk of maltreatment. Items written for the PFS measure parents' and caregivers' expectations of their child, confidence in parenting, and understanding of child development. For this study, the operational definition of knowledge of parenting and child development is how parents understand child development, utilize effective child management techniques, and have age-appropriate expectations for children's abilities.

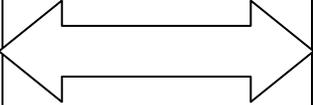
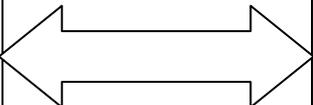
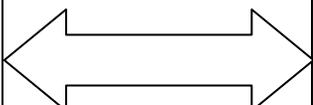
The PFS was developed to measure the constructs described in the previous section: family functioning, social support, concrete support, and nurturing and

attachment. Specific items that were written to measure the protective factors are provided in the Research Methodology section (See Table 10).

Revision of the CSSP protective factors. Since their initial publication on the protective factors and the development of the Protective Factors Survey, CSSP has revised the definition of parental resilience from “the ability to cope and bounce back from all types of challenges (CSSP, 2004a)” to “the ability to establish positive relationships, including attachment to a child; capacity to cope with stresses of daily life and recover from challenges (Langford & Harper-Browne, in press). In the current publication, CSSP also mentions nurturing and attachment as a component of parental resilience (Langford & Harper-Browne, in press). In a recent request for proposals for a demonstration project for the Quality Improvement Center on Early Childhood (Daro, Barringer, English, 2009), nurturing and attachment was identified as a sixth protective factor. The CSSP revisions more closely align with the PFS than the original operational definitions. Table 3 presents the alignment of the PFS constructs with the revised CSSP protective factors.

Table 3

Alignment of CSSP and PFS Constructs

CSSP Construct and Operational Definition	Alignment between CSSP and PFS	PFS Construct and Operational Definition
<p>Parental Resilience: The ability to establish positive relationships, including attachment to a child; capacity to cope with stresses of daily life and recover from challenges.</p>		<p>Family Functioning: Having adaptive skills to persevere in times of crisis. Family ability to openly share positive and negative experiences and mobilize to accept, solve, and manage problems.</p>
		<p>Nurturing & Attachment: The emotional tie along with a pattern of positive interaction between the parent and child that develops over time.</p>
<p>Social Connections: Friends, family members, neighbors, and others who provide emotional support and concrete assistance to parents.</p>		<p>Social Support: Perceived informal support (from family, friends, and neighbors) that helps provide for emotional needs.</p>
<p>Concert Support in Times of Need: Financial security to cover basic needs and unexpected costs; formal supports like Temporary Assistance to Needy Families; Medicaid and job training;</p>		<p>Concert Support in Times of Need: Perceived access to tangible goods and services to help families cope with stress, particularly in times of crisis or</p>

crisis services, including mental health, domestic violence and substance abuse.		intensified need.
Knowledge of Parenting and Child Development: Accurate information about child development, appropriate developmental expectations, and knowledge of alternative discipline techniques.	<i>(not included in Confirmatory Factor Analysis)</i>	Knowledge of Parenting and Child Development: Understanding and utilizing effective child management techniques and having age-appropriate expectations for children's abilities.
Children's Social and Emotional Competence: A child's ability to interact positively with others and communicate his/her emotions effectively.		Not included in the PFS because the intent was to develop an easy-to-administer measure of protective factors in parents and caregivers.

Purpose of the Study

Many community-based programs funded under CBCAP are implementing parent education programs. Most of these programs conduct little to no research and minimal evaluation on their programs. What is done often consists of satisfaction surveys or documentation of outputs. As a result, states cannot report overall effects of prevention expenditures and are searching for valid and reliable, easy-to-administer, and affordable instruments to measure the protective factors known to reduce the likelihood of child maltreatment. Such was the case with 12 parent education programs in Nevada funded under CBCAP. The programs, offering parent

education programs ranging from two-hour workshops to intensive multiple-week sessions, each used different tools to document change. All of the programs incorporate the Strengthening Families approach into their parent education program. The Nevada Department of Health and Human Services (2008), Grants Management Unit, decided to utilize the PFS as a common measure across all programs. The director of the Grants Management Unit, Tobi Hyman, and this researcher both served on the PFS Subcommittee and forged a partnership to assess the psychometric properties of the PFS with a large sample with over 1,000 participants in one of the twelve parent education programs. A full description of the Nevada context is provided in the Methodology section.

Although the PFS holds promise as a valid and reliable tool to measure multiple protective factors, the factor structure of the PFS needed to be confirmed with a population receiving parent education before it could be used to evaluate program effectiveness. Further, the stability of the instrument at multiple points in time also needed to be established. The overall purpose of the study was to contribute to the validity and reliability of the PFS. Types of reliability explored were instrument stability and internal consistency. While the protective factors have been well-documented individually as insulating children from abuse, limited research had been done to evaluate the relationships between the protective factors in the PFS. Convergent validity, which posits that similar constructs should be related to one another (Shadish, Cook, & Campbell, 2002), was addressed by exploring the relationships between the protective factors. As specified in the research questions

and hypotheses below, some of the constructs in the PFS were expected to be positively moderately or highly correlated with one another.

Research Questions and Hypotheses

To establish the PFS as a psychometrically-sound instrument to measure multiple protective factors, the overall research question was: To what extent is the PFS a valid and reliable instrument of multiple protective factors? Several additional research questions were posed to evaluate the psychometric properties of the PFS.

- 1) To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?

Hypothesis 1: The manifest variables will load highly on the appropriate factors.

- 2) What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)?

Hypotheses 2a: Family functioning and social support will be highly positively correlated (Jack, 2000).

Hypothesis 2b: Social support and concrete supports will be positively moderately correlated (Coohey, 1996).

Hypothesis 2c: Social support and nurturing and attachment will be highly positively correlated (Crockenberg, 1981).

- 3) To what extent does the underlying structure of the PFS remain stable across time?

Hypotheses 3a: The factor loadings for each construct will remain stable across time.

Hypothesis 3b: The relationships between the constructs will remain stable across time.

Hypothesis 3c: Latent mean scores will differ from Time One to Time Two.

4) What is the internal consistency of the items in each of the subscales?

Hypothesis 4: Internal consistency for each subscale will exceed a Cronbach alpha of .8.

Chapter 2: Research Methodology

Procedure

The researcher partnered with The Nevada Department of Health and Human Services (DHHS) Grants Management Unit study to obtain additional data independent from previous PFS studies to evaluate reliability and validity of an instrument to measure multiple protective factors in families. DHHS is the lead agency, as designated by Governor Jim Gibbons for the Community-Based Child Abuse and Prevention Program (CBCAP) and also directs child maltreatment prevention activities in Nevada. DHHS promotes the health and well-being of Nevadans by delivering and facilitating essential services to ensure that families are strengthened, public health is protected, and individuals achieve the highest level of self-sufficiency (DHHS, 2008). The Grants Management Unit (GMU) is an administrative unit within DHHS that manages grants to local, regional, and statewide programs in the State. The GMU is responsible for several state and federal initiatives, including the Children's Trust Fund (CTF).

The CTF was established in 1985 by Chapter 432 of Nevada Revised Statutes to fund primary and secondary child maltreatment prevention programs. CTF monies are comprised of funds from CBCAP and a three dollar fee on Nevada birth and death certificates and total approximately one million dollars per year. Two external policy groups advise the GMU—the Advisory Committee on Problem Gambling and the Grants Management Advisory Council (GMAC). The DHHS and GMAC release a Request for Applications every two years to disperse the CTF

monies. Grants are awarded competitively to community-based programs in Nevada that propose services to prevent child maltreatment and strengthen families.

Awardees are required to participate in quarterly networking meetings, as well as meet the federal reporting requirements of CBCAP.

Nationally, CBCAP incorporated the protective factors into their conceptual framework for prevention work (Child Welfare Information Gateway, 2008). As a result, many states, including Nevada, embedded the protective factors into existing programming. In fiscal year 2009 (July 1, 2008) the GMU began requiring grantees that receive CTF funds for parenting programs to use the Protective Factors Survey, so that GMU could obtain common outcomes from the grantees by using a valid and reliable instrument across all parent education programs. The use of a common instrument would enable GMU to report statewide results on their annual CBCAP Federal report, inform technical assistance decisions, and compare the level of protective factors across programs prior to and after receiving services.

Prior to data collection, staff received the PFS Users Manual (See Appendix B) and participated in a webinar on administering the PFS and using the database, which is downloadable at <http://www.friendsnrc.org/outcome/resources.htm>. Programs administered the PFS before services were offered (pre) and at the conclusion of the parent education program (post). Staff from each program entered pre- and post-data for each quarter utilizing the FRIENDS database and transferred the data quarterly to GMU. FRIENDS, the National Resource Center for Community Based Child Abuse Prevention, created the database to assist agencies in

managing data and creating reports (FRIENDS National Resource Center for Community-Based Child Abuse Prevention, 2008). This researcher was actively involved in data collection efforts and provided technical assistance to the GMU on survey administration and data integrity throughout the study period. Human subjects' approval was obtained from the Human Subjects Committee-Lawrence to receive and analyze the secondary data. Staff from the GMU provided the database to the researcher in a compressed Access file.

Participants

The GMU attempted to collect data on every person participating in parenting education programs funded between July 1, 2008 and September 30, 2009. Parent education programs ranged from day-long workshops (Love & Logic) to eight to twelve week classes such as Parenting Wisely and the Nurturing Parenting Program. All program staff received training on the protective factors as defined by the Strengthening Families Initiative and incorporated the approach into their evidence-based program. Over a thousand parents or caregivers in Nevada began a parenting education program. Of these 1,078 participants, 762 completed a parent education program and provided pre and post survey data. All individuals who completed the parent education program also completed the PFS. The program completion rate was 71 percent, meaning that 316 individuals dropped out of the program or did not finish it. Reasons for attrition were not made available. Completion rates of agencies ranged from zero percent to 100 percent. Five agencies reported troublesome dropout rates, with more than half of participants leaving the program prior to completion—

Area Health Education Center, Churchill County School District, Family Resource Center of Northeast Nevada, Ron Wood Family Resource Center, and Salvation Army. Table 4 displays the agency, the type of parent education program, and the number of participants and completion rates by agency.

Table 4

Agency and Number of Participants

Agency Name	Parent Education Program	Participants	Completers (Rate)
Area Health Education Center	Parenting Wisely	32	6 (19%)
Advocates to End Domestic Violence	STEP Parenting Program	29	27 (93%)
Committee to Aid Abused Women	Parenting Wisely	15	15 (100%)
Clark County Dept. of Family Services	Nurturing Parenting Program	638	416 (65%)
Churchill County School District	Shaken Baby Program; Parenting Wisely and Parents as Teachers	22	2 (9%)
Family Resource Center of Northeast Nevada	Active Parenting Now/Teens; 1, 2, 3, 4 Parents	24	10 (42%)
No To Abuse	Nurturing Parenting Program	16	13 (81%)
Shade Tree	Nurturing Parenting Program	128	127 (99%)
Washoe County Family Resource Center	Nurse Family Partnership	87	87

			(100%)
Wells Family Resource Center	Active Parenting	59	59
			(100%)
Ron Wood Family Resource Center	Positive Action	13	0
			(0%)
Salvation Army	Nurturing Parenting Program	15	0
			(0%)
Total		1,078	762
			(71%)

Of the sample of 1,078 participants for whom pre-post data were available, almost 80 percent of the participants were women, and the average age was 32 years old. The sample reflects the diversity of the Nevada population, with half being White. A little more than a fourth of the sample was married, the majority were low income, and one third had less than a high school education. Of the staff-reported data available for this variable, half of the respondents had no Child Protective Services (CPS) involvement while one third had been involved with CPS. Table 5 reports the demographics from the full sample of 1,078 participants who completed the survey prior to receiving services.

Table 5

Demographic Characteristics

Characteristic	<i>N</i> =1078
Age	<i>n</i> =1061
	<i>M</i> =32.02
	<i>SD</i> =10.40
Gender	<i>n</i> =1067
Female	78.3%
Male	21.7%
Race	<i>n</i> =1066
Native American	4.3%
African American	18.5%
Hispanic or Latino	19.1%
White	49.2%
Multi-Racial	5.3%
Other	3.6%
Marital Status	<i>n</i> =1075
Married	27.3%
Partnered	11.9%
Single	40.7%
Divorced	12.6%
Other (Widowed, Separated)	7.5%

Education	<i>n</i> = 1064
Elementary or junior high school	4.3%
Some high school	25.6%
High school diploma or GED	35.5%
Trade/vocation school	4.1%
Some college	21.1%
Associates or above	9.4%
Income Level	<i>n</i> =1058
\$0-10,000	48.0%
\$10,001-20,000	14.7%
\$20,001-30,000	9.9%
\$30,001-40,000	9.5%
\$40,001-50,000	6.8%
More than \$50,000	11.1%
Housing	<i>n</i> =1066
Own	18.2%
Rent	39.6%
Shared housing	15.0%
Temporary/Homeless	27.2%
How Completed	<i>n</i> =822
Face to face	11.6%
Staff available	86.2%
No staff present	2.2%

CPS Involvement	<i>n</i> =760
No	51.4%
Yes	33.5%
Not sure	15.1%

Measures—The Protective Factors Survey

The Protective Factors Survey (See Appendix C) begins with demographic items about program participation, some of which are completed by staff and some by the participant himself/herself. The demographics section contains questions about the individual completing the survey, family composition, level of involvement with services, and ancillary services the participant may be receiving. Participants are then asked to respond to a series of 20 statements about their family, using a seven-point frequency or agreement scale. This study uses four of the subscales in the PFS—family functioning, social support, concrete support, and nurturing and attachment.

Development of the PFS. Prior to the present study, the PFS has undergone four rounds of field-testing to explore and assess the content validity of the instrument, internal structure of the subscales, relationships among the protective factors and other measures of risk of abuse, the stability of the instrument, and the validity of the PFS as a measure of change over time. These phases were conducted primarily with participants in home visitation programs.

Phase I. A mixed methods approach, including survey research and focus groups, guided the initial development of the PFS. For example, items were preliminarily tested by asking participants to complete the instrument along with a

survey assessment form evaluating each of the individual items across four areas: the participants' interpretation of the meaning of the question, the cultural appropriateness/offensiveness of the items, necessary revisions for questions, and the appropriateness of the answer options. Focus groups were then conducted to gather input on the items as written and suggestions for revisions. The resulting items were field tested with CBCAP-funded programs in Texas (N=272) and Healthy Families programs in Kansas (N=74) Kansas. Forty nine items were included in this original version, many of which exhibited marked skewness and moderate kurtosis, cross-loaded on multiple factors, and did not meet a minimum factor loading of .3 or .4, which is considered to be a minimum loading (Brown, 2006; Hair, Anderson, Tatham, & Black, 1998). No clear factor structure emerged, therefore researchers decided to conduct a more extensive literature review, refine the item pool, and conduct additional analyses with other samples (Counts, Buffington, Chang-Rios, & Rasmussen, & Preacher, in press).

Phase II. The purposes of this phase were to 1) generate a pool of items aligned with the protective factors as defined in the extended literature review, 2) evaluate the internal structure of the instrument using exploratory factor analysis, and 3) establish criterion-related validity by examining the relationships between the protective factors and other measures of risk for child abuse and neglect. The intent was to retain a small, integrated set of items with at least three to four highly correlated items per construct.

Community-based agencies across the nation were recruited through the distribution of a recruitment flyer on numerous national electronic-mail based listservs, including Early Childhood Comprehensive Systems (ECCS), Community-Based Child Abuse Prevention (CBCAP), Child Abuse Prevention Partners, Child Welfare League of America Southern Region, Circle of Parents, National Alliance of Children's Trust and Prevention Funds, and FRIENDS National Resource Center for Community-Based Child Abuse Prevention. Interested agencies completed a web-based registration survey and received technical assistance on survey administration via a webinar. Eleven home visitation agencies opted to participate and administered the PFS, the Brief Child Abuse Potential Inventory, and one of three validation measures between February and May 2007. Of the 249 participants, a majority of participants were female (87.1 percent), spoke English (99.6 percent), and were birth parents to their children (96 percent). The average age of participants was 28 years old. Participants were poor, with 80 percent reporting annual household incomes of less than \$30,000. The sample was ethnically diverse—61.8 percent White (Non-Hispanic/European American), 12 percent Native American (American Indian/Alaskan Native), 14.8 percent African American, 5.6 percent Hispanic or Latino/a, 2.8 percent Multi-Racial 2.8 percent and less than 1 percent Asian and Native American/Pacific Islander. Thirty-four percent of participants were referred by Child Protective Services (N = 85) (Counts, et al, 2008a).

Each agency received a survey packet composed of three instruments: the Protective Factors Survey, the Brief Child Abuse Potential Inventory (BCAP:

Ondersma, Chaffin, Simpson, & LeBreton, 2005), and one validation instrument (a measure of coping, depression, or stress) to assess criterion related validity.

Completion order of the PFS subscales and the validation measures was counterbalanced to reduce the possibility of order effects (Shadish, Cook, & Campbell, 2002). All respondents were asked to complete the PFS, BCAP, and one of the other validation instruments to reduce participant burden.

An exploratory factor analysis (EFA) using MPlus v. 5 (Muthén & Muthén, 1998-2007) was conducted to explore the theoretical underpinnings of the 45 items and to determine if the items loaded on the subscales as predicted. MPlus was used to fit the model, using a robust weighted least squares estimator (WLSMV; Flora & Curran, 2004; West, Finch, & Curran, 1995) to account for nonnormality. A scree plot (Gorsuch, 1983), comparative fit, and interpretability were used to determine the number of factors to retain. Although not definitive, the scree plot suggested that five factors be retained. Loadings above .3 were considered noteworthy. However, based on a combination of standard factor retention criteria, model fit, and interpretability, a four-factor EFA solution was chosen as the most appropriate model for the retained items (RMSEA = .09 and SRMR = .047). Additional items were removed due to low loadings, cross-loadings, and parsimony, yielding a final scale with 27 items. Power estimates were calculated with the sample size of 249 ($df=249$) and returned a value approaching 1.0 (Preacher & Coffman, 2006), indicating that there was sufficient power to detect good model fit. Three subscales demonstrated adequate levels of internal consistency—family functioning=.94, social support=.86,

and nurturing and attachment=.83. The Cronbach alpha for concrete support (.63) was not in the acceptable range.

To examine criterion-related validity of the PFS, correlation coefficients were calculated between the PFS subscales and each of the other measures and are presented in Table 6. The four subscales in the PFS were significantly negatively correlated with the Brief Child Abuse and Potential Inventory, a 34-item screening tool to detect physical abuse and neglect (Ondersma, Chaffin, Simpson, & LeBreton, 2005), and the Perceived Stress Scale, a 10-item scale measuring perceptions of stress (Cohen, Karmarck, & Mermelstein, 1983). All subscales, with the exception of concrete support, were also significantly associated with the PRIME-MD Patient Health Questionnaire, a nine-item measure of depression (Spitzer, Kroenke, & Williams, 1999). Concerning maladaptive coping strategies, family functioning was negatively related to the maladaptive coping strategy of denial in the Brief COPE, a 40-item instrument with four subscales measuring adaptive and maladaptive coping strategies (Carver, 1997). The PFS subscales were all significantly positively associated with the adaptive coping strategy of positive reframing. The COPE subscale for Emotional Support was also found to be significantly positively correlated with family functioning, social support, and concrete support (Counts, et al., in press).

Table 6

Correlations between PFS Subscales and Validation Scales

	BCAP (N=204)	PSS (N=60)	PHQ (N=67)	COPE - D (N=87)	COPE - SU (N=87)	COPE - ESS (N=87)	COPE - ISS (N=87)	COPE - PR (N=87)
FF	-.54**	-.38**	-.35*	-.26**	-.17	.38**	.26**	.39**
SS	-.43**	-.28*	-.54**	-.07	-.21	.58**	.52**	.36**
CS	-.35**	-.54**	-.09	-.17	-.10	.24*	.25*	.32*
NA	-.34**	-.30*	-.27*	.16	-.16	.21	-.03	.24*

Note. BCAP = Brief Child Abuse Potential Inventory; PSS = Perceived Stress Scale; PHQ = PRIME-MD Patient Health Questionnaire; Cope Scales – D = Denial; SU = Substance Use; ESS = Emotional Social Support; ISS = Instrumental Social Support; PR = Positive Reframing. FF = Family Functioning; Social Support = Social Support; CS = Concrete Support; NA = Nurturing and Attachment; KPCD = Knowledge of Parenting/Child Development.

^a Item was reverse coded for correlational analyses

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

Phase III. The purposes of this phase were to 1) to confirm the factor structure found in Phase II, 2) evaluate the stability of the instrument over time, and 3) examine predictive validity of the protective factors and health and other measures of risk for child abuse and neglect. Once again, agencies were recruited through national listservs. Additionally, a flyer was distributed at the national 2007 CBCAP grantees' conference. Participation was open to any prevention program that could administer the survey at two points in time. Seventy-one interested agencies completed a web-based registration survey. Of the registered agencies, about one quarter (19) were able to meet the study requirements and participated in this round. The average time lag between surveys was 34 days. A total of 689 surveys were collected from the 19 agencies for Time One survey administration, and 291 surveys from 15 agencies were collected for Time Two survey administration. States participating in both survey administration time points were Georgia, Illinois, Kansas, Kentucky, Maine, New York, South Carolina, Virginia, and Washington (Counts, Buffington, Chang-Rios, Preacher, & Rasmussen, 2008b).

The sample was predominantly female (89.3 percent), and the average age was 30.4 years. Again, the sample was ethnically diverse—62.5 percent White, 1.4 percent Native American (American Indian/Alaskan Native), 24.7 percent African American, 8.2 percent Hispanic or Latino/a, 2.4 percent Multi-Racial, and less than 1 percent Asian and Native American/Pacific Islander. Twenty-four percent of participants were referred by Child Protective Services (N = 71). Four-fifths of the sample reported annual incomes under \$30,000.

A confirmatory factor analysis (CFA) using MPlus v. 5 (Muthén & Muthén, 1998-2007) was conducted with this new data set (N=689) to see if results and the factor structure could be replicated in an independent sample. The factor loadings and fit were similar to those in the EFA, suggesting that the factor structure held and could be generalized to a new sample of home visitation program participants. Power estimates were calculated with the sample size of 689, $df=98$, alpha of .05, null value of .05 and alternative value of .08 and returned a value approaching 1.0 (Preacher & Coffman, 2006), indicating that there was sufficient power to detect good model fit. Cronbach alphas of the subscales in the CFA were above adequacy for three of the subscales at Time One and Time Two: family functioning (.87, .90), social support (.89, .88), and nurturing and attachment (.81, .82). The Cronbach alpha for concrete support was adequate at both time points (.76, .79).

The primary reason for collecting data at two time points was to establish the degree to which the PFS subscales remain stable over time. Authors expected the factors to be significantly correlated over time, providing evidence for construct stability. The within-factor correlations were hypothesized to be stronger than the between-factor correlations. Within-factor correlations ranged from .624 to .829. Between-factor correlations ranged from .147 to .628. Correlations are reported in Table 7.

Table 7

Time One – Time Two Correlations of PFS Factors

	FFT1	SST1	CST1	NAT1	FFT2	SSTS	CST2	NAT2
FFT1	1.000							
SST1	<i>.605</i>	1.000						
CST1	<i>.265</i>	<i>.376</i>	1.000					
NAT1	<i>.451</i>	<i>.359</i>	<i>.180</i>	1.000				
FFT2	<i>.829</i>	<i>.578</i>	<i>.234</i>	<i>.364</i>	1.000			
SST2	<i>.495</i>	<i>.764</i>	<i>.300</i>	<i>.228</i>	<i>.628</i>	1.00		
CST2	<i>.271</i>	<i>.364</i>	<i>.624</i>	<i>.164</i>	<i>.197</i>	<i>.276</i>	1.00	
NAT2	<i>.344</i>	<i>.241</i>	<i>.169</i>	<i>.814</i>	<i>.429</i>	<i>.249</i>	<i>.147</i>	1.000

Note. All correlations are significant at $p = .05$. FFT1 = Family Functioning Time One, SST1= Social Support Time One, CST1 = Concrete Support Time One, NAT1 = Nurturing & Attachment Time One, FFT2 = Family Functioning Time Two, SST2= Social Support Time Two, CST2 = Concrete Support Time Two, NAT2 = Nurturing & Attachment Time Two. Within time correlations are italicized.

To examine predictive validity of the PFS, each of the three criterion validity measures was correlated with the Time One PFS subscales. The PRIME-MD Patient Health Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999) is a brief measure of depression, consisting of nine items based on DSM-IV diagnostic criteria. The Perceived Stress Scale (PSS; Cohen, Karmarck, & Mermelstein, 1983) is a 10-item scale assessing the participant's experienced level of stress and depression. The Physical Health and Functioning instrument is a 19-item scale designed to measure caregiver health and functioning. The scale consists of items drawn primarily from the RAND 36-Item Health Survey 1.0 (Hays, Sherbourne, & Mazel, 1993). The PFS

subscales at Time One were significantly negatively correlated with Time Two stress and depression scores and positively related to the health subscales. Two exceptions must be noted—concrete support at Time One was not significantly related to Time Two depression, and Time One nurturing and attachment was not significantly related to physical functioning (health subscale). Time One PFS subscales were negatively related to Time Two stress. Further, the PFS was positively related to all six subscales of the Rand Health Survey at Time Two. Table 8 shows the correlations (Counts, et al., 2008b).

Table 8

Time One PFS – Time Two Criterion Scale Correlations

	Stress	Depr.	General Health	Physical Funct.	Role Limit.	Social Funct.	Pain Pain	Energy/ Fatigue
FF1	-.452*	-.283*	.325*	.144*	.228*	.223*	.214*	.281*
SS1	-.321*	-.297*	.305*	.145*	.267*	.295*	.209*	.232*
CS1	-.253*	-.107	.147*	.140*	.118*	.209*	.121*	.133*
NA1	-.229*	-.185*	.175*	.073	.120*	.173*	.159*	.135*

Note. *Correlations are statistically significant at $p=.05$. FF1 = Time One Family Functioning, SS1= Time One Social Support, CS1 = Time One Concrete Support, NA1 = Time One Nurturing & Attachment.

Phase IV. The purposes of this phase were to 1) assess the validity of the PFS as a measure of change over time, 2) examine convergent and discriminant validity, and 3) compare results from a pre-post design with a retrospective pre-post

design. Agencies were recruited via national listservs, and flyers were distributed at the national 2007 CBCAP grantees' conference. Nineteen agencies from 13 states completed a web-based registration survey. To be eligible for participation, agencies had to be able to administer the surveys at two different time points within a six month field-testing period. To obtain a "true" pre-test score, the surveys had to be administered prior to receiving services. The time lag between pre-program and post-program surveys was required to be a minimum of one month and a maximum of five months, and varied depending on the services provided. Because of the time constraints, the Time Two tests were not necessarily administered after the completion of the program. At Time One, 218 surveys were collected from nine agencies. States participating in both survey administration time points were California, Connecticut, Tennessee, Utah, and Vermont. Fewer than half completed the post- survey (N=94). The average time lag between pre-program and post-program surveys was 67 days (Counts, et al., 2008b).

The average age of the 94 participants who completed Time One and Time Two surveys was 32.4 years. The majority were female (68.1 percent) and almost 80 percent of the sample was White (Non-Hispanic). Fifty-three percent of participants were referred by Child Protective Services ($N = 50$). A majority of the sample (65.9 percent) reported annual incomes equal to or less than \$30,000.

Each agency received two survey packets: a pre-program packet and a follow-up packet. The pre-program survey packet contained the PFS and validation measures on affect, social desirability, and optimism. The post-program survey

packet contained the same validation measures and a PFS retrospective pre-test version. In this format, participants were instructed to respond to the items from the perspective of how they felt on the day of the survey. Participants were then presented with the same 23 statements about their family and asked to respond to the items from the perspective of how they felt when they started the program.

Four sets of analyses were conducted: factor analyses to examine the factor structure of the pre-test, retrospective, and post-test responses; paired sample *t*-tests to evaluate the comparability of the traditional pre-test and retrospective pre-test subscales; a series of *t*-tests to examine a change over time comparison of pre-test and post-test subscale scores; and correlational analyses to assess convergent and discriminant validity. Mplus v. 5 (Muthén & Muthén, 1998-2007) was used to fit CFA models using maximum likelihood estimation. The resulting loadings conformed closely to the expected four-factor structure found in other phases for the pre-test, post-test, and retrospective subscale items. Power estimates were calculated with the sample size of 94, *df*=98, alpha of .05, null value of .05 and alternative value of .08 and returned a value approaching 1.0 (Preacher & Coffman, 2006), indicating that there was sufficient power to detect good model fit.

All four subscales, with the exception of pre-test concrete support, demonstrated adequate levels of internal consistency. During Phase IV, one item was removed from the nurturing and attachment subscale and two knowledge of parenting items were dropped, resulting in the current, 20-item version. Cronbach's alphas for each subscale were, for pre-test, retrospective pre-test, and post-test respectively,

family functioning (.89, .94, .91), social support (.90, .93, .91), concrete support (.67, .86, .77), and nurturing and attachment (.84, .84, .81). It is interesting to note that the concrete support subscale registered the highest Cronbach alpha in the field tests on the retrospective version, given its low score on the other versions and in previous testing phases.

Paired sample *t*-test results of the true pre-test and retrospective pre-test found no mean differences between family functioning, concrete support, or nurturing and attachment. However, the social support subscale showed a statistically significant difference between the two types of pre-tests. Change over time was examined for both versions. On the true pre-test, change scores were only significant for family functioning. Using the retrospective pre-test as a baseline resulted in statistically significant change scores on family functioning, nurturing and attachment, and social support.

Convergent and discriminant validity were examined through PFS subscale correlations with positive and negative affect, optimism, pessimism, and social desirability. Based on previous research, a positive relationship was expected between the protective factors and positive affect and optimism and a negative relationship between the protective factors and negative affect and pessimism. With the exception of concrete support, the PFS pre-test subscales were significantly positively correlated with the positive affect items of the Positive and Negative Affectivity Scale (PANAS: Thompson, 2007) a 10-item survey to measure positive and negative affect. The retrospective-pre-test and PFS post-test were not

significantly related to optimism. In all three versions of the PFS, family functioning and social support were positively correlated with the Life Orientation Test-Revised (LOT-R: Scheier, Carver, and Bridges, 1994), a ten-item measure of individual differences in dispositional optimism-pessimism. Concrete support was positively associated with optimism in the retrospective pre-test, and nurturing and attachment was related to optimism in the pre-test. Family functioning, social support, and nurturing and attachment were negatively related to negative affect using all three instruments, with the exception that nurturing and attachment was unrelated to negative affect on the post-test. Family functioning and social support were negatively related to pessimism using all three instruments, except that social support was unrelated to negative affect using the retrospective instrument. Due to the low reliability of the Marlowe Crowne Social Desirability Scale (Crowne & Marlowe, 1960) in the sample, the relationship between protective factors and social desirability could not be explored.

In summary, the factor structure of the three versions was consistent. However, there were differences between how the retrospective pre and true pre-tests functioned both with the validation scales and on change scores. Mean scores on the retrospective pre-test tended to be lower than those of the true pre-test, resulting in larger change scores for the retrospective version. It was not possible to determine the cause of the differences in versions or to identify the type of bias that could influence the results. As a result, there was no conclusive evidence of which version—true or retrospective—is the most valid (Counts, et al., 2008b).

Limitations. The four phases of PFS testing have established the instrument as a valid and reliable tool to measure multiple protective factors. However, some major limitations remain and are addressed through the present study. First, the PFS has predominantly been tested with home visitation programs, therefore cannot be generalized to participants in parent education programs or other settings. Second, the small sample sizes in Phase II and Phase IV may affect the confidence in the accuracy of the parameter estimates (Kelley, Maxwell, Rausch, 2003). Although the sample sizes had power to detect good model fit, the fit statistics do not guarantee meaningful parameter estimates (Schumacker & Lomax, 2004). Third, in Phase IV, correlations were examined between Time One and Time Two administration of the protective factors. When estimating the within-factor correlations, the between-factor correlations were not controlled for, consequentially, the relationships between Time One and Time Two may have been inflated. To look at stability in the present study, between-factor correlations will be controlled for, and the unique attributes of each factor will be extracted. Finally, to date, time constraints have not allowed for an administration of the PFS to one population both prior to services and after services have been completed. Thus, the instrument's ability to measure change over time has not been examined. The present study addresses this issue by administering the PFS prior to services and again at post with a large sample of participants in parent education.

Analytic Strategy

Power. To determine the sample size needed to achieve power of .80 for detecting good fit, the MacCallum, Browne, & Sugawara (1996) method for power analysis and determination of sample size was used. In this method, effect size is defined as the difference between a null value and alternative value of the root-mean square error of approximation (RMSEA; Steiger, 1990). The null value of .05 represents a close fit and the alternative value of .08 is a not-close fit. The sample size (N=1078) is more than adequate to reject the hypothesis that the model is a close fit with the data when the actual model fit is not close. Using the Preacher & Coffman Power and Sample Size Calculator for RMSEA (2006), the minimum sample size required to reject the null hypothesis of close fit (.05) when the fit is poor (.08), is 60 cases. Power estimates were calculated with the sample size of 1078, df=362, alpha of .05, null value of .05 and alternative value of .08 and returned a value of 1.0 (Preacher & Coffman, 2006). (RMSEA and degrees of freedom calculations are fully discussed in later sections.)

Data preparation and screening. Data were imported into SPSS from Access, and demographic variables were re-coded as string variables. The number of children was calculated for each participant. Because the PFS was designed for caregivers or parents, those individuals who were pregnant at the time of survey administration were removed from the data set. Items 8, 9, and 11 were reverse scored. Frequencies were run for all variables using SPSS (2009). Outliers, missing data, and out-of-range values can greatly affect the variance-covariance among

variables, and bias analysis results (Schumacker & Lomax, 2004). An Access form was used for data entry, therefore there were no responses outside the range of 1-7 for the PFS items.

Normality. In inferential statistics, data are assumed to be distributed normally (Schumacker & Lomax, 2004), thus data were examined for skew and kurtosis prior to the examination of missing values and data imputation. A sample is considered to be normally distributed when the values of a variable are symmetrically dispersed or in a bell-shaped curve (Weinbach & Grinell, 2001). In structural equation modeling, parameter estimates and standard errors are more accurate when normality assumptions are met (Enders, 2001). SPSS was used to examine multivariate normality for the 30 items included in this study. The post-test item in the nurturing and attachment subscale “I am happy being with my child” exhibited negative skew (-3.23) and kurtosis (13.54). Descriptive statistics and distributional data, including skewness and kurtosis, are presented in the results section.

Missing data. Prior to addressing missing data, the researcher explored data on non-completers of the post-test to determine if there were systematic differences between the two groups. Of the 1,078 participants who took the PFS at pre test, 71 percent or 762 completed the parent education program and the PFS at both time points. These individuals are labeled as “completers.” The other 316 participants, or 29 percent of the sample, dropped out of the program and did not complete the program or the PFS at two time points. These individuals were termed “non-

completers.” Comparison tests were conducted between the completers and non-completers to determine if there were major differences between the two groups.

The total amount of missing data was 15.3 percent. The maximum amount of missing data for one variable was 29.4 percent, which is equivalent to the number of individuals who did not complete the parent education program or the PFS post-test. Common approaches such as listwise deletion, pairwise deletion, and similar response pattern imputation to treating missing values are problematic in research and can reduce power and lead to biased estimates (Acock, 2005; Schafer & Graham, 2002). Full Information Maximum Likelihood (FIML) is superior to the aforementioned missing data techniques and results in unbiased parameter estimates (Enders & Bandolos, 2001) and was used to treat the missing data in this study. FIML does not deal with missing data by imputation. Rather than imputing data, the method incorporates a mean-structure and estimates all parameters and standard errors directly by using all the observed data. By including the partially completed cases, the method guides the estimator algorithm toward a more accurate set of parameters by accounting for the relationships between the variables in the model (Enders, 2001; Enders, 2006). When the input data and models are the same (Collins, Schafer, & Kam, 2001) and the number of imputations is sufficiently large or as Schafer & Graham (2002) write, “approaches infinity” (p. 1), the results of MI and FIML are equal. In essence, the exact number of imputations needed to reach equivalency is unknown. However, it is generally thought that the greater the number of imputations, the more accurate are the results (Graham, Olchowski, & Gilreath,

2007). Because of the relative ease in using FIML and the better results unless one has achieved the sufficient number of imputations (unknown), FIML was used in this study to address missing data.

The research design. The study used a One-Group Pre-test-Post-test Design (Shadish, Cook, & Campbell, 2002) and is presented in Table 9. Participants received parent education represented by X in the design. All participants received the PFS (O) prior to receiving any parent education and again after they completed the program.

Table 9

Research Design

Outcome	Assignment to Parent Education	Outcome
O ₁	X	O ₂

Structural equation modeling (SEM). Structural equation modeling was the statistical analysis procedure used to answer the research questions. SEM is a generic term that describes four models—path analysis, confirmatory factor analysis, structural regression, and latent change (Raykov & Marcoulides, 2000). Unique characteristics of SEM are 1) the inclusion of variables that are not directly observable, 2) corrections for measurement error, 3) the ability to fit models to covariance or correlation matrices (Raykov & Marcoulides, 2000), and 4) the evaluation of an entire model (Kline, 1998), which enables the evaluation of the PFS

measurement model as a whole rather than only as a sum of individual subscales.

This study utilized a measurement model and a structural model.

Confirmatory factor analysis. Confirmatory factor analysis is the measurement model of SEM, and enables the researcher to specify and test a model for how the hypothesized constructs are reflected by observed variables that are directly measured (Raykov & Marcoulides, 2000). CFA will contribute to the reliability and validity evidence of the PFS as an instrument to measure multiple protective factors (Mueller, 1996). CFA enables the mathematical testing of the items in the PFS to measure the hypothesized constructs of the protective factors and the stability of the underlying factor structure at two time points (Schumacker & Lomax, 2004). The protective factors are latent constructs or variables that cannot be directly observed, and therefore must be measured indirectly through observed or indicator variables (Schumacker & Lomax, 2004). Like intelligence and achievement, the presence of family functioning, social support, concrete support, and nurturing achievement cannot be directly observed. However, latent variables can be measured indirectly through indicator or observed variables. The purpose of CFA, unlike exploratory factor analysis, is to add evidence in support of a hypothesized factor structure. The development of a CFA model begins with theory or research-based hypotheses about how observable variables measure their corresponding latent constructs, and permits testing the model's consistency with the observed data using SEM software (Raykov & Marcoulides, 2000).

In this study, MPlus v. 5 (Muthén & Muthén, 1998-2007) was used to conduct the CFA due to the non-normality of the data and the availability of the FIML estimation method in this statistical package. Mplus uses a Maximum Likelihood Robust (MLR) estimator for samples departing from normality, which is needed in this study because of the moderate skew and kurtosis of one item (Muthén & Muthén, 2006). Mplus adjusts the Chi-Square fit statistic and adjusts standard errors (West, Finch, & Curran, 1995) so that other estimates are not biased. As previously stated, FIML was used to treat missing data. When using the FIML estimator, the presence of missing data with non-normal data does not exacerbate the issue and results in similar confidence intervals with zero percent and 25 percent missing data rates. FIML is nominally affected by the shape of the distribution, so is the method of choice for non-normal missing data (Enders, 2001).

Based on the research base and the operational definitions of the constructs, four factors were expected to emerge from the data. Table 10 shows the factors, the operational definitions, and the items that are expected to load on each factor. These factors—family functioning, social support, concrete support, and nurturing and attachment—are considered to be reflective or uni-dimensional. These four scales are expected to contain items that have a common core, which can be explored statistically (Bagozzi, 1982 ; Bagozzi, & Fornell, 1982). Thus, internal consistency of these scales is of interest. The other factor—knowledge of parenting and child development—on the other hand, is considered to be formative in nature. That is, the items written for this factor are expected to explore various dimensions, including an

understanding of child development, effective child management techniques, and realistic expectations for the child. Because this factor is formative, there is no theoretical reason to expect the items to conform to any particular factor structure (Bollen & Lennox, 1991), hence it was not included in the CFA. For this formative factor, internal consistency is irrelevant. Rather, content validity is of concern.

Table 10

Constructs, Operational Definition, & Expected Items to Load

Construct	Operational definition	Items
Family functioning	Having adaptive skills to persevere in times of crisis. Family ability to openly share positive and negative experiences and mobilize to accept, solve, and manage problems.	1-5
Social support	Perceived informal support (from family, friends, and neighbors) that helps provide for emotional needs.	6, 7, 10
Concrete support	Perceived access to tangible goods and services to help families cope with stress, particularly in times of crisis or intensified need.	8, 9, 11
Nurturing and attachment	The emotional tie along with a pattern of positive interaction between the parent and child that develops over time.	17- 20

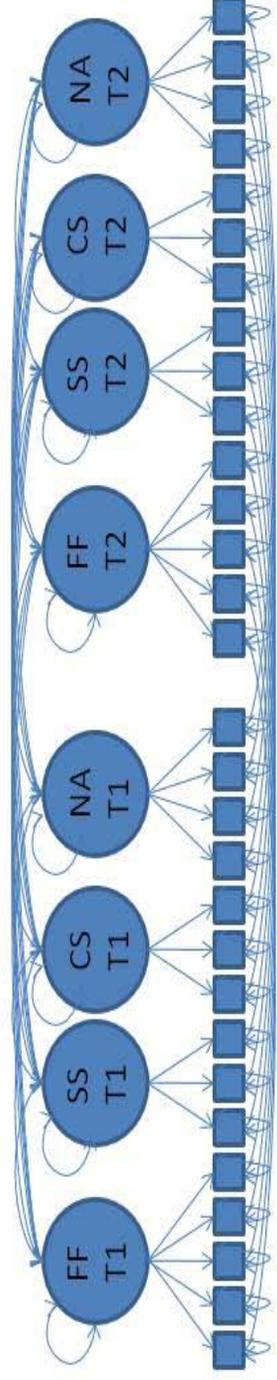
(Counts, et al, 2007)

The longitudinal CFA or measurement model is presented in Figure 2. The pre-test is indicated by T1 and the post-test as T2. The circles represent the latent constructs of the protective factors and are labeled for each subscale (FF: Family Functioning, SS: Social Support, CS: Concrete Support, and NA: Nurturing and Attachment). The 30 items in the PFS (15 at Time One and 15 at Time Two) are

represented by squares, with arrows indicating the predicted construct on which they are expected to load.

Figure 2

One Group Longitudinal CFA with All Parameters Estimated (including residuals)



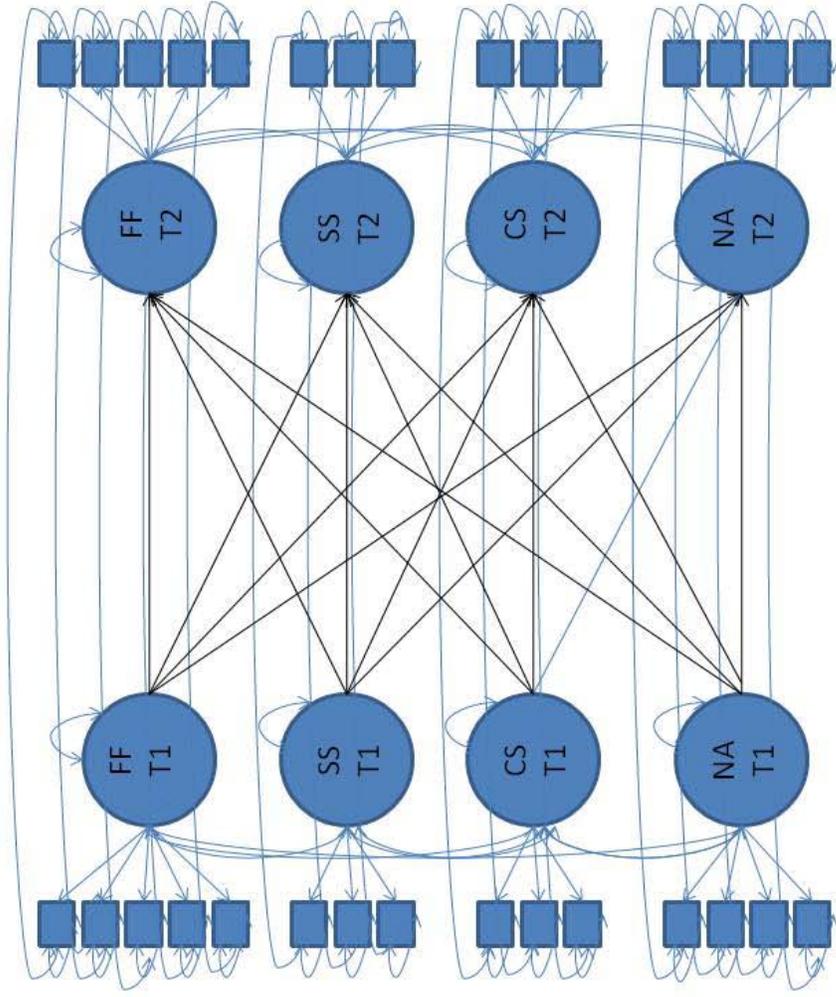
Six rules specify the parameters in an SEM model and are represented by directional arrows, which are predictive or causal and bi-directional arrows. Parameters are a generic term that represent characteristics of a population. Because the overall characteristics are difficult to obtain, sample statistics are used to estimate the parameters. In SEM, parameters are the unknown aspects of the phenomenon under study and are estimated in the model. The bi-directional arrows represent covariance or correlation (Raykov & Marcoulides, 2000). Applying these rules to the one-group longitudinal model results in 103 parameter estimates. Degrees of freedom are calculated by $p(p+1)/2 - (\text{number of parameters})$ (Raykov & Marcoulides, 2000). The p is the number of observed variables in each group, or in this case 30. The $p(p+1)/2$ represents the number of known variances/covariances of observed variables. Thus, the degrees of freedom for this model are $30(30+1)/2 - 103 = 362$. CFA models are under-identified if the number of summary statistics (means, variances, and covariances) are fewer than estimated parameters, just-identified if statistics and estimated parameters are equal, and over-identified if the number of statistics is fewer than the number of estimated parameters. Models must be either just-identified or over-identified to yield accurate estimates (Mueller, 1996). In this model, the number of known parameters greatly exceeds the number of parameters to be estimated; therefore the model is over-identified.

Structural model. Structural regression models are similar to CFA models except they allow explanatory or predictive relationships between latent variables (Raykov & Marcoulides, 2000). This model can be used to test hypothesized

relationships of the Protective Factors Survey. The same six rules for determining model parameters were applied to this model. This model is also overidentified and has 362 degrees of freedom. The main difference between the two models is that the latent variables at Time One are hypothesized to predict the latent variables at Time Two; hence the arrows are uni-directional rather than bi-directional. Figure 3 shows the structural regression model.

Figure 3

Structural Regression Model



Goodness of fit. Fit indices determine the degree to which the observed values are predicted by the estimated model. In other words, the fit indices indicate how well the model reflects the data. In this study, four indices are used: χ^2 , the Non-Normed Fit Index (NNFI; Bentler, 1990), the Comparative Fit Index (CFI; Bentler, 1990), and the Root-Mean-Square-Error of Approximation (RMSEA; Hu & Bentler, 1998). The χ^2 statistic was one of the first fit indices and is a rough estimation of model fit. A large value relative to the number of degrees of freedom indicates that the model does not fit the data well, whereas a small value indicates a good fit (Hu & Bentler, 1998). The χ^2 statistic is very sensitive to sample size, therefore it is recommended to supplement it with other indices (Kline, 1998). The NNFI represents the improvement in model fit relative to a null model (Bentler, 1990). To be considered a good fit, values must be above .90. The CFI is similar to the NNFI and is also included because it is less affected by sample size (Kline, 1998). Finally, RMSEA evaluates the absolute fit of a model and allows the calculation of a confidence interval. Values less than .05 indicate a close fit, while values above .10 indicate potentially serious errors in model specification (Browne & Cudeck, 1993).

The Research Questions and Models

Although there is strong preliminary evidence to support the internal consistency, stability, and construct validity of the PFS subscales, the present study examined these psychometric properties with a large sample of participants in parent education programs at a true pre and post survey administration. Table 11 shows

how each research question was addressed by the models. The fourth question was addressed using SPSS.

The measurement model (CFA) enables the researcher to examine the factor structure and to determine if the observed variables load onto the four factors as hypothesized and to examine the relationships between the protective factors. To determine if the instrument is stable across time points, measurement equivalence was examined. Measurement equivalence means that the characteristics of the items and the latent constructs are consistent across various conditions (Horn & McArdle, 1992). In this case, measurement equivalence across time points was investigated. Nested models were used to compare a null model with an alternative model (Kline, 1998). The null model estimates all parameters, and the alternative model constrains relationships.

Several types of measurement invariance can be used to evaluate metric equivalence and were examined to look at model fit and determine stability of the instrument. In other words, it must be determined that the psychometric relationships between the observed items and latent constructs are the same at both time points (Lee, 2009). Since the chi-square statistic rarely shows model fit because of its sensitivity to sample size, other fit indices such as CFI were used in addition to chi-square (Cheung & Rensvold, 2002) to compare fit. CFI is independent of model complexity and sample size. A change in the CFI value smaller than or equal to .01 indicates that the null model of invariance should not be rejected. Stated differently, a CFI change value of less than .01 means that the models are the same. (The change

score of .01 was established by conducting a large simulation study comparing 20 general fit indices and their ability to detect model change (Cheung & Rensvold, 2002)).

In this study, the progression of measurement invariance was as follows. First, configural invariance tests were conducted to assess the overall fit of the model to see if the conceptual constructs are the same at both time points. Second, item-level invariance was examined by constraining corresponding loadings at each time point to be equivalent in this model. Third, equivalence of construct covariance was examined by constraining the covariances between the latent constructs within time points to equality. In both of these models, it was expected that the model fit would be equivalent with the constraints. Finally, equivalence of latent means was examined by fixing the latent means to be equal. Because it was expected that the means would change over time, it was not expected that these constraints would result in the same model fit. In this alternative model, a change in CFI was desired and would indicate that there was a change in construct scores, perhaps as a result of the intervention.

The structural model allowed the researcher to examine the predictive attributes of the protective factors and to assess the ability of the protective factors at Time One to predict the protective factors at Time Two. Table 11 shows the questions, the model used, and the explanation for why the model is appropriate to answer the research question.

Table 11

Research Questions, Model, and Explanation

Question	Model	Explanation
1) To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?	Measurement	High factor loadings provide evidence that the indicators converge on a construct (Little & Card, 2009).
2) What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)?	Measurement & Structural	Convergent validity posits that similar constructs should be related to one another (Shadish, Cook, & Campbell, 2002).
3) To what extent does the underlying structure of the PFS remain stable across time?	Measurement	Measurement invariance will be examined to determine if the PFS versions measure the same constructs consistently across time points (Cheung & Rensvold, 1999).
4) What is the internal consistency of the items in each of the subscales?	SPSS— Cronbach Alpha	Cronbach's alpha estimates how well the items in the subscale reflect the same construct or protective factor (Cronbach, 1951). To be considered a reliable subscale, Cronbach's alpha must be above .80.

Chapter 3: Results

This chapter presents the results of the PFS Time One to Time Two study with a large sample of participants in parent education programs in the State of Nevada. Results are presented as follows: 1) sample, 2) examination of normality, and 3) research question to answer the overall research question of the study: To what extent is the Protective Factors Survey Version a valid and reliable instrument of multiple protective factors? Based on the results, it is briefly noted whether the hypotheses for each question are supported or not supported. (Chapter 4 considers the research questions in detail, connects them to the literature, and explores potential reasons for the findings.) The measurement and structural models that were used to answer the research questions are presented, along with fit statistics. Finally, additional analyses conducted to explore predictive relationships are presented.

Sample

As mentioned above, 1,078 participants completed the PFS at pre-test only and 71 percent or 762 participants completed the PFS at both time points. Comparison tests were conducted between the completers and non-completers to determine if there were significant differences between the two groups. Table 12 displays the results.

Table 12

Comparison of Completers and Non-Completers on Pre-test

Characteristic	Completers N=762	Non-Completers N=316	Comparison Test
Age	n=761 M=31.80	n=300 M=32.58	t(1059)=1.19, p=.236
Income Level	n=755 M=2.41	n=303 M=2.58	t(1056)=1.43, p=.153
Gender	n=762	n=305	$\chi^2(1, N=1067)=.871,$ p=.351
Female	76.4%	79.0%	
Male	23.6%	21.0%	
Race	n=760	n=306	$\chi^2(5, N=1066)=5.91,$ p=.315
Native American	5.1%	2.3%	
African American	17.8%	20.3%	
Hispanic or Latino	18.4%	20.9%	
White	50.0%	47.4%	
Multi-Racial	5.1%	5.6%	
Other	3.6%	3.6%	
Marital Status	n=760	n=315	$\chi^2(4, N=1075)=6.95,$ p=.139
Married	27.5%	26.7%	
Partnered	10.8%	14.6%	
Single	41.6%	38.4%	
Divorced	11.7%	14.6%	

Other (Widowed, Separated)	8.4%	5.7%	
Education	<i>n</i> = 758	<i>n</i> =306	$\chi^2(5, N=1064)=4.22,$ <i>p</i> =.518
Elementary or junior high school	4.0%	5.2%	
Some high school	25.6%	25.5%	
High school diploma or GED	36.8%	32.4%	
Trade/vocation school	4.1%	4.2%	
Some college	19.9%	24.2%	
Associates or above	9.6%	8.5%	
Income Level	<i>n</i> =755	<i>n</i> =303	$\chi^2(5, N=1058)=8.13,$ <i>p</i> =.149
\$0-10,000	49.1%	45.2%	
\$10,001-20,000	15.6%	12.5%	
\$20,001-30,000	9.1%	11.9%	
\$30,001-40,000	8.3%	12.2%	
\$40,001-50,000	7.2%	5.9%	
More than \$50,000	10.6%	12.2%	
Housing	<i>n</i> =759	<i>n</i> =307	$\chi^2(4, N=1066)=60.43,$ <i>p</i> =.000
Own	18.4%	17.6%	
Rent	34.9%	51.1%	
Shared housing	14.1%	17.3%	
Temporary/Homeless	32.5%	14.0%	

On the majority of the demographics—age, gender, race, marital status, education, and income level—there were no statistically significant differences between the completers and non-completers. However, on the housing variable, the Chi-square revealed that completers and non-completers differed significantly in terms of where they live. Completers had more than twice the rate of non-completers who were either homeless or lived in temporary arrangements. Cramér's V was calculated to evaluate the effect size, or if the difference between the housing status of participants was of practical significance (Cramér's $V = .238, p=000$). Although Cramér's V ranges from -1 to 1, with zero indicating no relationship, the association can be related to sample size and number of categorical variables (Agresti, 2002). Accordingly, this effect size is considered to be moderate.

Independent sample t -tests were conducted to determine if there were statistically significant differences between the completers and non-completers on the PFS subscales: family functioning, social support, concrete support, and nurturing and attachment. Table 13 shows the results. On the family functioning and concrete support subscales, completers and non-completers reported similar mean scores. Non-completers reported statistically significant lower mean scores on the social support and nurturing and attachment subscales. Cohen's d was calculated to determine if the effect size or difference between the subscale means is of practical concern (Cepeda, 2008). On both of the subscales, the effect size was minor and does not meet Cohen's threshold for even a small effect (SS: $d=.16$; NA: $d=.16$), (Cohen, 1992).

Table 13

Comparison of Completers and Non-Completers on PFS Pre Subscale Scores

PFS Subscale	Completers (Pre and Post) N=762	Non-Completers (Pre Only) N=316	Comparison Test
Family functioning (FF)	<i>M</i> =4.94	<i>M</i> =4.82	<i>t</i> (1074)=-1.39, <i>p</i> =.165
Social support (SS)	<i>M</i> =5.50	<i>M</i> =5.27	<i>t</i> (1074)=-2.33, <i>p</i> =.020
Concrete support (CS)	<i>M</i> =5.06	<i>M</i> =4.99	<i>t</i> (1074)=-.588, <i>p</i> =.557
Nurturing and Attachment (NA)	<i>M</i> =6.10	<i>M</i> =5.94	<i>t</i> (1054)=-2.33, <i>p</i> =.020

Examination of Normality

The maximum-likelihood estimate produces more accurate parameter estimates, fit statistics, and standard errors when normality assumptions are met (Enders, 2001), therefore the 30 items included in the measurement and structural models were examined for normality. A normal distribution is a symmetrical dispersion of the values of a variable, or a bell-shaped curve (Weinbach & Grinell, 2001). Descriptive statistics are presented in Table 14. Items with skew values above 3.0 were considered extremely skewed and items with kurtosis values above 10.0 problematic (Kline, 1998). With the exception of one item, the items showed minimal skew and kurtosis and were normally distributed. The post-test item “I am happy being with my child” exhibited negative skew (-3.23) and kurtosis (13.54). This item is in the nurturing and attachment subscale. To account for the nonnormal

data, maximum-likelihood estimation with robust standard errors (MLR) was used.

In simulations, MLR has been found to produce satisfactory results with missing data and non-normal data distributions (Muthén & Asparouhov, 2002).

Table 14

Descriptive Statistics for the PFS Items included in the confirmatory factor analysis

Items	N		Mean		SD		Skewness		Kurtosis	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1. In my family, we talk about our problems.	1076	1076	4.93	4.93	1.51	1.51	-0.39	-0.39	-0.27	-0.27
2. When we argue, my family listens to “both sides of the story.”	762	762	5.23	5.23	1.33	1.33	-0.52	-0.52	-0.07	-0.07
3. In my family, we take time to listen to each other.	1074	1074	4.64	4.64	1.65	1.65	-0.23	-0.23	-0.53	-0.53
4. My family pulls together when things are stressful.	762	762	5.03	5.03	1.40	1.40	-0.34	-0.34	-0.21	-0.21
5. My family is able to solve our problems.	1072	1072	4.89	4.89	1.57	1.57	-0.37	-0.37	-0.47	-0.47
6. I have others who will listen when I need to talk about my problems.	762	762	5.25	5.25	1.34	1.34	-0.46	-0.46	-0.21	-0.21
7. When I am lonely, there are several people I can talk to.	1076	1076	5.24	5.24	1.62	1.62	-0.63	-0.63	-0.36	-0.36
8. I would have no idea where to turn if my family needed food or housing.	762	762	5.56	5.56	1.35	1.35	0.70	0.70	0.07	0.07
9. I wouldn't know where to go for help if I had trouble making ends meet.	1073	1073	4.83	4.83	1.54	1.54	-0.38	-0.38	-0.26	-0.26
10. If there is a crisis, I have others I can talk to.	762	762	5.28	5.28	1.32	1.32	0.47	0.47	-0.12	-0.12
11. If I needed help finding a job, I wouldn't know where to go for help.	1076	1076	5.53	5.53	1.59	1.59	-1.15	-1.15	0.68	0.68
17. I am happy being with my child.	762	762	5.75	5.75	1.33	1.33	-1.29	-1.29	1.78	1.78
18. My child and I are very close to each other.	1075	1075	5.26	5.26	1.75	1.75	-0.91	-0.91	-0.13	-0.13
19. I am able to soothe my child when he/she is upset.	762	762	5.63	5.63	1.45	1.45	-1.19	-1.19	1.12	1.12
20. I spend time with my child doing what he/she likes to do.	1071	1071	5.38	5.38	1.93	1.93	-0.97	-0.97	-0.31	-0.31
	761	761	5.68	5.68	1.79	1.79	-1.30	-1.30	0.58	0.58
	1072	1072	4.99	4.99	2.08	2.08	-0.65	-0.65	-0.94	-0.94
	761	761	5.42	5.42	1.92	1.92	-1.05	-1.05	-0.15	-0.15
	1076	1076	5.51	5.51	1.64	1.64	-1.15	-1.15	0.53	0.53
	762	762	5.76	5.76	1.38	1.38	-1.36	-1.36	0.18	0.18
	1074	1074	4.75	4.75	1.17	1.17	0.47	0.47	-1.22	-1.22
	760	760	4.72	4.72	2.20	2.20	0.45	0.45	-1.25	-1.25
	1054	1054	6.54	6.54	0.93	0.93	-2.31	-2.31	5.58	5.58
	746	746	6.60	6.60	0.89	0.89	-3.23	-3.23	13.54	13.54
	1053	1053	6.19	6.19	1.25	1.25	-1.62	-1.62	2.20	2.20
	747	747	6.37	6.37	1.09	1.09	-2.06	-2.06	4.57	4.57
	1053	1053	5.80	5.80	1.35	1.35	-1.05	-1.05	0.43	0.43
	747	747	6.03	6.03	1.17	1.17	-1.19	-1.19	1.08	1.08
	1055	1055	6.69	6.69	1.34	1.34	0.90	0.90	0.32	0.32
	747	747	6.04	6.04	1.13	1.13	-1.42	-1.42	2.64	2.64

The Measurement Model (CFA)

As described in the Research Methodology, confirmatory factor analysis, the measurement model of SEM, was used to see how well the hypothesized constructs were reflected by the observed variables or in this case, the PFS items. Additionally, the measurement model provides evidence of the reliability and validity of the PFS. Before examining each question independently, it is important to look at the overall fit of the null model depicted in Figure 2. In the null model, all parameters are allowed to be estimated. In comparison to other models, the null model is often referred to as configural invariance (Cheung & Rensvold, 2002) and is labeled as such in Table 15.

Examining fit indices helps determine the degree to which the observed values are predicted by the estimated model. In other words, the fit indices provide a statistical way to quantify the degree to which the observed data (responses on PFS items at pre and post) coincide with theoretical expectations. As suggested in the literature, model fit was evaluated using several general fit indices (Kline, 1998). The model chi-square fit statistic for the four-factor model indicates poor model fit, however it is very sensitive to large samples sizes and tends to result in large Chi-Square values (Kline, 1998). Because of the chi-square statistic's sensitivity to large sample sizes, other fit indices were examined, including the NNFI, CFI, and RMSEA. To be considered a good fit, NNFI values must be above .90, CFI .90, and RMSEA less than .05. Results for the configural invariance or null model were NNFI=.968, CFI=.973, and RMSEA=.028. Overall, the fit indices indicate that the measurement model exhibits extremely good fit. Thus, it can be said that the PFS items functioned as expected and corresponded with the theoretical assumptions. Fit values for the configural invariance model and subsequent alternative models are presented in Table 15.

Table 15

Fit Indices

	χ^2	df	p	$\Delta\chi^2$	Δdf	p	RMSEA	NNFI	CFI	ΔCFI
Configural Invariance	664.798	362	<.001				.028	.968	.973	
Loading Invariance	729.907	377	<.001	56.65	15	<.001	.029	.964	.969	.004
Equality of Correlations Stability	731.016	383	<.001	2.42	6	.88	.029	.965	.969	<.001
Latent mean Invariance	849.286	387	<.001	125.87	4	<.001	.033	.954	.959	.01
FF Invariance	759.837	384	<.001	32.10	1	<.001	0.30	.962	.967	.002
SS Invariance	741.437	384	<.001	10.47	1	<.001	.029	.964	.968	.001
CS Invariance	805.218	384	<.001	75.41	1	<.001	.032	.958	.963	.006
NA Invariance	752.239	384	<.001	23.58	1	<.001	.030	.963	.967	.002

*Because MLR was used, chi-square difference scores were computed using a scaling factor (Satorra, 2000).

Fit statistics may demonstrate that the model conforms to the data, however the fit statistics do not provide information about the validity of the parameter estimates. Figure 2 presented the model, in which all the parameters are freely estimated. In SEM, parameters are the relationships between observed variables, latent variables, and errors. Six rules specified the parameters and resulted in 103 estimates, which are defined as all the uni and bi-directional arrows in the figure. Models may exhibit good fit and acceptable structure despite poor or meaningless parameter estimates (Schumacker & Lomax, 2004). For that reason, parameters were examined because they address research questions 1 and 2.

Question 1: To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?

The measurement model was used to answer this question because high factor loadings provide evidence that the indicators converge on a construct or stated differently, that the observed variables measure a latent construct. Based on the literature, items were expected to load onto one of the four protective factors.

Hypothesis 1: The manifest variables will load highly on the appropriate factors. Table 16 presents the latent construct with hypothesized items, the loading estimates from MPlus, standardized loadings, standard errors, p-values, and R^2 . All 30 items were statistically significant, and standardized estimates ranged from .455 to .883. With the exception of the item in the concrete support subscale, “If I needed help finding a job, I wouldn’t know where to go for help,” the items exhibited high loadings above .650. In a confirmatory factory analysis, one rule of thumb is that

loadings should be .7 or higher. The rationale is that a loading of that magnitude indicates that almost half of the variance of the indicator is explained by that factor. Some researchers acknowledge that this standard is difficult to achieve in real world situations, therefore accept levels as low as .3 or .4 (Brown, 2006; Hair, Anderson, Tatham, & Black, 1998).

Summary. Using the higher standard of .7, 27 out of the 30 factor loadings met this threshold. R^2 output is also provided to show the amount of variance in the item accounted for by the latent variable. Hypothesis 1 is supported.

Table 16

PFS Items and Factor Loadings

Factor	Estimate	Standardized	Std. Error	p-	R^2
Item		Loading		value	
Family functioning Time 1					
Item 1	1.096	.727	.047	.000	.528
Item 2	1.341	.816	.042	.000	.666
Item 3	1.373	.873	.038	.000	.762
Item 4	1.237	.763	.045	.000	.582
Item 5	1.133	.735	.046	.000	.541
Social support Time 1					
Item 6	1.305	.819	.049	.000	.670
Item 7	1.499	.853	.048	.000	.728
Item 10	1.291	.789	.052	.000	.622
Concrete support Time 1					
Item 8	1.735	.833	.057	.000	.694

Item 9	1.568	.812	.059	.000	.659
Item 11	1.010	.466	.070	.000	.217
Nurturing and attachment Time 1					
Item 17	.647	.696	.041	.000	.484
Item 18	1.038	.832	.041	.000	.692
Item 19	1.042	.778	.045	.000	.605
Item 20	.990	.734	.046	.000	.539
Family functioning Time 2					
Item 1	1.082	.807	.043	.000	.651
Item 2	1.238	.876	.038	.000	.768
Item 3	1.175	.869	.041	.000	.755
Item 4	.995	.732	.048	.000	.536
Item 5	.972	.735	.047	.000	.540
Social support Time 2					
Item 6	1.144	.853	.057	.000	.727
Item 7	1.292	.883	.054	.000	.780
Item 10	1.112	.802	.059	.000	.643
Concrete support Time 2					
Item 8	1.484	.830	.069	.000	.690
Item 9	1.608	.836	.065	.000	.700
Item 11	.998	.455	.080	.000	.207

Nurturing and attachment Time					
2					
Item 17	.582	.655	.052	.000	.429
Item 18	.912	.825	.046	.000	.681
Item 19	.874	.739	.048	.000	.546
Item 20	.856	.746	.053	.000	.557

*(labeled according to PFS item number in Appendix C).

Question 2: What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)? Convergent validity means that similar constructs should be related to one another (Shadish, Cook, & Campbell, 2002). The measurement model was used to examine relationships between the constructs (protective factors). Correlations are reported in Table 17. Between-factor correlations within each time point were all significantly positively correlated and ranged from .067 to .472. Predictive relationships of the factors across time were examined through a structural model and are presented later in this chapter.

Three hypotheses were made about the relationships between the protective factors. Results for each are presented below. A discussion of the findings within a broader context is provided in the Discussion and Conclusions chapter.

Hypotheses 2a: Family functioning and social support will be highly positively correlated (Jack, 2000). The literature suggests a relationship between social support and family functioning (Walsh, 2002; Jack, 2000; Bronfenbrenner, & Crouter, 1983; Dunst, 2000), however the strength of the relationship is unspecified .

This study hypothesized a strong correlation between the two protective factors. Results indicated a moderate relationship between family functioning and social support at Time One (.472) and Time Two (.429).

Summary. The relationship between the family functioning and social support is in the direction specified and is moderate, not strong. The hypothesis is not supported and is discussed at length in the Discussion and Conclusions.

Hypothesis 2b: Social support and concrete support will be positively moderately correlated (Coohey, 1996). Social support and concrete support are described as inter-woven concepts in the literature (Thoit, 1982; Cameron, 1990; Gottlieb, 1983; DePanfilis, 1996). Therefore, it was hypothesized that the relationship between the protective factors would be positively moderately correlated. Results of this study indicated a weak relationship in the direction predicted (Time One: .270; Time Two: .233).

Summary. The relationship between social support and concrete support is in the direction specified and is weak, not moderate. The hypothesis is not supported and is discussed fully in the final chapter.

Hypothesis 2c: Social support and nurturing and attachment will be highly positively correlated (Crockenberg, 1981). Early studies of nurturing and attachment identified social support as a strong predictor of nurturing and attachment (Crockenberg, 1981). Accordingly, the relationship between the protective factors of social support and nurturing and attachment was hypothesized to be highly positively correlated. Relationships between the factors varied at the time points.

At Time One, the relationship was the strongest and can be described as moderate (.354). The relationship between social support and nurturing and attachment was smaller at Time Two, and approached moderate (.270).

Summary. The relationship between social support and nurturing and attachment is in the direction specified and is moderate, not strong. The hypothesis is not supported and is discussed fully in the final chapter.

Table 17

Time One – Time Two Correlations of PFS Factors

	FFT1	SST1	CST1	NAT1	FFT2	SSTS	CST2	NAT2
FFT1	1.000							
SST1	.472	1.000						
CST1	.260	.270	1.000					
NAT1	.445	.354	.165	1.000				
FFT2	.719	.359	.228	.371	1.000			
SST2	.321	.642	.255	.196	.429	1.000		
CST2	.197	.247	.722	.106	.211	.233	1.000	
NAT2	.318	.262	.084	.775	.391	.270	.067	1.000

Note. All correlations are significant at $p = .000$. FF1 = Time One Family functioning, SS1= Time One Social support, CS1 = Time One Concrete support, NA1 = Time One Nurturing & Attachment, FF2 = Time Two Family functioning, SS2= Time Two Social support, CS2 = Time Two Concrete support, NA2 = Time Two Nurturing & Attachment.

Question 3: To what extent does the underlying structure of the PFS remain stable across time? Measurement invariance was examined to determine if the PFS was stable and measured the four protective factors consistently across time

points. Stability is critical to compare results of treatment effectiveness across groups or longitudinally (Pentz & Chou, 1994). Without stability, results are untrustworthy. As indicated above, the measurement model examining configural invariance indicated a close fit to the sample data and showed that the PFS had the same factor structure at Time One and Time Two. To examine instrument stability, three increasingly restrictive models were fit to the data to assess whether the PFS is equivalent across time points. As described in the methodology section, measurement invariance was examined by equating the factor loadings in Time One to Time Two (loading invariance), equating the correlations (Equality of Correlations—Stability), and equating the latent means (latent mean invariance). A CFI change (from the progressively constrained models) of equal to or less than .01 indicates that the models are essentially the same (Cheung & Rensvold, 2002). Correspondingly, Hypothesis 3a is addressed by loading invariance, Hypothesis 3b by equality of correlations, and Hypothesis 3c by latent mean invariance. Results of the increasingly constrained models are presented in Table 15.

Hypotheses 3a: The factor loadings for each construct will remain stable across time. When the loadings were set to be equal, the CFI change (.004) between the constrained and baseline model was less than .01 indicating that the loadings are the same across time points (See Table 15). Table 18 shows the equated estimates and standardized loadings. It must be noted that Mplus uses the variances of the indicators and the latent variables to standardize loadings. Therefore, even when the loadings are constrained to be equal, indicators at Time One and Time Two will have

slightly different variances. Only very strong factorial invariance (loadings, indicator means, and indicator variances all equal across time), which is rare and not of interest here, will result in the standardized loadings being the same (Muthén & Muthén, 1998-2007). Since changes in subscale scores were expected as a result of the intervention, strong factorial invariance was neither expected nor desired.

Summary. The CFI change of less than .01 indicates that the factor loadings function similarly across time points. In other words, they measure the constructs consistently regardless of administration point. The hypothesis is supported, and factor loadings are stable across time.

Table 18

Measurement Invariance: PFS Items and Equated Factor Loadings

Factor	Estimate	Std.		Std.	p-value
Item		Loading*		Error	
Family functioning		T1	T2		
Item 1	1.105	.731	.809	0.035	.000
Item 2	1.308	.811	.885	0.033	.000
Item 3	1.293	.858	.890	0.033	.000
Item 4	1.136	.731	.778	0.039	.000
Item 5	1.067	.712	.767	0.038	.000
Social support		T1	T2		
Item 6	1.244	.805	.871	0.040	.000
Item 7	1.415	.837	.902	0.042	.000
Item 10	1.221	.771	.828	0.043	.000
Concrete support		T1	T2		
Item 8	1.613	.801	.866	0.050	.000
Item 9	1.588	.824	.820	0.048	.000
Item 11	0.999	.461	.453	0.061	.000
Nurturing and Attachment		T1	T2		
Item 17	0.626	.684	.682	0.038	.000
Item 18	0.992	.819	.847	0.039	.000
Item 19	0.979	.754	.777	0.039	.000
Item 20	0.938	.714	.777	0.041	.000

Hypothesis 3b: The relationships between the constructs will remain stable across time. Equivalence of latent covariances was examined by constraining the covariances between the latent constructs within time points. Correlations were set to be equal to examine the stability of the instrument across time points. The change in CFI between the loading invariance and the equality of correlations models was less than .001 and indicates that the relationships between factors at Time One are similar to relationships between factors at Time Two (See Table 15). All correlations are significant at $p = .000$, with the exception of concrete support at Time One with nurturing and attachment at Time Two ($p=.046$). Table 19 shows the correlations at Time One and Time Two constrained to be equal, as well as the relationships between factors at Time One and Time Two.

Summary. The change in CFI was miniscule and is far below the minimum threshold of .01 that would indicate a difference between the two models. Thus, this hypothesis is supported, and the relationships between the constructs are consistent or stable across regardless of administration time point.

Table 19

Measurement Invariance: Equated Correlations at Time One and Time Two

	FF1	SS1	CS1	NA1	FF2	SS2	CS2	NA2
FF1	1.000							
SS1	<i>.462</i>	1.000						
CS1	<i>.243</i>	<i>.262</i>	1.000					
NA1	<i>.430</i>	<i>.331</i>	<i>.132</i>	1.000				
FF2	<i>.721</i>	<i>.365</i>	<i>.224</i>	<i>.381</i>	1.000			
SS2	<i>.333</i>	<i>.649</i>	<i>.258</i>	<i>.218</i>	<i>.462</i>	1.000		
CS2	<i>.213</i>	<i>.259</i>	<i>.721</i>	<i>.124</i>	<i>.243</i>	<i>.262</i>	1.000	
NA2	<i>.326</i>	<i>.270</i>	<i>.086</i>	<i>.779</i>	<i>.430</i>	<i>.331</i>	<i>.132</i>	1.000

Note. FF1 = Time One Family functioning, SS1= Time One Social support, CS1 = Time One Concrete support, NA1 = Time One Nurturing & Attachment, FF2 = Time Two Family functioning, SS2= Time Two Social support, CS2 = Time Two Concrete support, NA2 = Time Two Nurturing & Attachment. Within time correlations are italicized.

Hypothesis 3c: Latent mean scores will differ from Time One to Time Two.

To determine if the scores from pre-post were truly different, the means were set to be equal between Time One and Time Two. Table 20 shows the equated mean estimates.

Table 20

Measurement Invariance: Equated Latent Means

	Estimate	S.E.	Est./S.E.	p-value
Family functioning	4.542	.153	29.597	.000
Social support	4.480	.166	27.019	.000
Concrete support	4.748	.301	15.768	.000
Nurturing and Attachment	5.962	.257	23.158	.000

For Hypothesis 3a and 3b, it was desired that the CFI change scores were below .01 because that indicates that the instrument is stable. However, for Hypothesis 3c, the desired CFI change score between the equality of correlations stability and the latent mean invariance models is above .01. A change in fit index would indicate that the models are different and that the protective factors have changed from Time One to Time Two. Such a change is expected and preferred when there is an intervention between administration points of the survey. In the present study, some type of parent education intervention occurred between the pre- and post-tests of the PFS. Therefore, setting the latent mean scores to be equal should, if the parent education programs are effective, result in worse model fit from the equality of correlations stability model. Results show a change in CFI of .01, which is the maximum threshold identified by (Cheung & Rensvold, 2002) for declaring the models to be equal.

Setting latent means to be equal across time points did not result in changes in model fit, which indicates that there was little change in the subscale scores.

However, this overall fit statistic does not enable closer examination of changes in model fit by factor. Therefore, differences in latent mean scores were more fully explored through constrained models in the CFA. To examine change in subscale scores across time points, four separate models were run—each equating the latent means while allowing the others to be estimated. Fit indices results are presented in Table 15. For family functioning, the change in CFI was .002, for social support .001, for concrete support .006, and for nurturing and attachment .002. The small changes in the CFI for each factor suggest that in this model, the latent means are the same across time points. These results may suggest that the interventions were not strong enough to result in substantive changes in the mean scores.

Because the overall change in CFI approached the threshold for difference between models, additional testing was done using SPSS to provide another perspective and enable the calculation of effect sizes and interpretation of the differences. Paired sample *t*-tests were conducted to determine if there were statistically significant differences between Time One and Time Two on the PFS subscales: family functioning, social support, concrete support, and nurturing and attachment. Table 21 shows the results. Cohen's *d* was calculated for each subscale to determine if the effect size was of practical significance (Cepeda, 2008). Respectively, effect sizes were family functioning $d=.33$, social support $d=.17$, concrete support $d=.14$, and nurturing and attachment $d=.22$. The effect sizes for the subscales, social support, concrete support, and nurturing and attachment were minor

and do not meet Cohen's threshold for even a small effect. Family functioning exhibited a small effect size (Cohen, 1988).

Table 21

Comparison Time One to Time Two PFS Subscale Scores

PFS Subscale	Time 1	Time 2	Comparison Test
Family functioning (FF)	$M=4.94$	$M=5.27$	$t(761) = -9.05, p=.00$
Social support (SS)	$M=5.50$	$M=5.71$	$t(760) = -4.73, p=.00$
Concrete support (CS)	$M=5.06$	$M=5.27$	$t(760) = -3.97, p=.00$
Nurturing and Attachment (NA)	$M=6.10$	$M=6.26$	$t(739) = -6.10, p=.00$

Summary. The change in CFI (.01) means that latent mean scores are essentially the same at both time points, possibly suggesting that the parent education program, coupled with Strengthening Families, had little to no impact on the protective factors (See Table 15). Paired sample t -tests in SPSS detected minor effect sizes with the exception of family functioning, which reported a small effect size. The results of both the invariance test of equated latent means in the CFA and the paired sample t -tests in SPSS imply that there is little change between the protective factors from Time One to Time Two, indicating that the hypothesis is not supported.

Question 4: What is the internal consistency of the items in each of the subscales? When measuring concepts such as the protective factors, it is critical to know if the items within each subscale consistently reflect the construct that the items are intended to measure. The most accepted way to determine scale reliability or

internal consistency is by examining the Cronbach alpha of the scale (Cronbach, 1951). While there is no definitive threshold for internal consistency, a Cronbach of .90 is considered excellent, .80 very good, and .70 adequate (Kline, 1998).

In the field tests, Cronbach alphas of the subscales in the measurement model were above .80 for family functioning, social support, and nurturing and attachment. Concrete support has ranged from .63 to .86, the latter score on the retrospective pre-test.

Hypothesis 4: Internal consistency for each subscale will exceed a Cronbach alpha of .8. As described above, .70 is considerate adequate for a scale's internal consistency. However, the authors of the PFS desired a higher standard of internal consistency exceeding .80. In the current study, three of the subscales exceeded the .80 standard of very good at Time One and Time Two: family functioning (.89, .90), social support (.86, .88), and nurturing and attachment (.84, .82). The Cronbach alpha for concrete support was determined to be adequate at both time points (.73, .72).

Summary. The internal consistency of the family functioning, social support, and nurturing and attachment subscales exceeds the desired standard of .80, suggesting that the items consistently reflect the concepts they were intended to measure. The concrete support subscale, while adequate, does not meet the standard preferred by this researcher. Potential reasons for the lower internal consistency of the concrete subscale are discussed at length in the final chapter. Because one of the four subscales did not exceed the .80 threshold, the hypothesis was not supported.

Additional Analyses: The Structural Model

In addition to examining the relationships between the protective factors, the researcher determined that it would also be informative to examine the ability of protective factor scores at Time One to predict protective factor scores at Time Two. A structural regression model was run to determine the ability of Time One subscale scores to predict Time Two subscale scores. Results are presented in Table 22. The shaded cells represent the independent variables at Time One. Under each subscale, the dependent variables (subscales at Time Two) are listed. The model chi-square fit statistic for the structural model was $\chi^2_{(383)} = 1025.265, p < .000$. The significant chi-square value indicates poor model fit, which is common in large samples sizes (Kline, 1998). Other fit indices examined were the NNFI (.935), CFI (.943), and RMSEA (.039). To be considered a good fit, NNFI values must be above .90, CFI .90, and RMSEA less than .05. Overall, the fit indices indicate that the measurement model exhibits extremely good fit. For each subscale, the Time One score predicted the Time Two score. All other paths were non-significant, meaning that only the factor itself at Time One predicts the mean score of that factor at Time Two. In other words, the mean score of family function at Time One will not predict the mean score of social support at Time Two, and so on.

Table 22

Structural Regression Model

	Estimate	S.E.	Est./S.E.	p-value
Family functioning T1				
Family functioning T2	.599	.042	14.219	.000
Social support T2	.025	.039	.646	.518
Concrete support T2	.008	.044	.176	.860
Nurturing and Attachment T2	-.018	.026	-.668	.504
Social support T1				
Family functioning T2	.009	.036	.248	.804
Social support T2	.536	.0942	12.614	.000
Concrete support T2	.074	.046	1.594	.111
Nurturing and Attachment T2	.004	.031	.143	.886
Concrete support T1				
Family functioning T2	.027	.033	.819	.413
Social support T2	.066	.034	1.950	.051
Concrete support T2	.642	.047	13.699	.000
Nurturing and Attachment T2	-.041	.028	-1.456	.145
Nurturing and Attachment T1				
Family functioning T2	.050	.032	1.567	.117
Social support T2	-.042	.036	-1.186	.236
Concrete support T2	-.034	.039	-.864	.388
Nurturing and Attachment T2	.677	.043	15.931	.000

Chapter 4: Discussion and Conclusions

This chapter revisits the progression of the research study and begins with a summary of the contextual issues, the unique attributes of this work, and a brief summary of the study's findings. Following is an in-depth discussion by research question and hypothesis, including how the findings relate to previous research and any potential issues that contributed to the findings. Finally, this chapter concludes with limitations, implications for practice, and directions for future research.

Context

In the first chapter, three contextual issues for this study were presented—1) the problem of child maltreatment and prevention programs, including parent education programs to decrease risk factors and increase protective factors, 2) the Strengthening Families approach, which suggests a protective factors lens to address child maltreatment, and 3) the lack of psychometrically sound, brief instruments that measure multiple protective factors specific to the Strengthening Families approach. The present study addresses the third issue and is unique in several ways. First, this study is the first large scale study of the Protective Factors Survey (PFS) with parent education programs. Second, although several states are using the PFS with prevention programs, this study is the first to examine the psychometric properties of an entire state's administration of the instrument. Third, this study is the first to examine the PFS in the natural context and flow of prevention programs. Previous field tests explored reliability and validity of the instrument, but the post-test was often at a contrived end date to meet the deadlines of the study.

In addition to design issues, this study contributes a valid and reliable instrument to explore effectiveness of an approach that has seen wide uptake in the field. In some ways the Strengthening Families approach has taken on the characteristics of a viral marketing campaign (Viral Marketing, 2010), an approach that relies on pre-existing social networks to spread the philosophy. In this case, conferences, organizations, webinars, state networks and other mechanisms within the maltreatment field have contributed to the broad uptake of the Strengthening Families approach. The spread has been quick. Organizations “catch it” in a way that is similar to the spread of pathological or computer viruses. The protective factors seem to make intuitive sense to practitioners and are imbedded in prevention approaches with little hesitation. Research and evaluation of the approach, however, have not spread as rapidly. As mentioned previously, there remains a gap in the research to document the approach’s effectiveness to increase protective factors in families and lead to a sustainable reduction in child maltreatment. In particular, many community-based programs that implement parent education programs lack the necessary resources to conduct evaluation efforts, including staff evaluation capacity and easy-to-administer instruments.

Brief Summary

The present study seeks to contribute further evidence of the sound psychometric properties of the PFS to measure multiple protective factors. To that end, the present study was designed to answer the overarching research question: To what extent is the PFS a valid and reliable instrument of multiple protective factors?

Sub-questions were posed to examine the reliability and validity of the instrument: 1) To what extent do the items (manifest variables) in the PFS define the protective factor constructs? 2) What are the underlying relationships among the protective factors as measured by the items in the PFS? 3) To what extent does the underlying structure of the PFS remain stable across time? and 4) What is the internal consistency of the items in each of the subscales?

Overall, the study provides psychometric data that supports a valid and reliable four-factor measurement and structural regression model to measure multiple protective factors in parents and caregivers who participate in parent education programs. Question 1 explored to what extent the observed variables in the PFS define the protective factors constructs (content validity and reliability). The items loaded on the hypothesized factors as predicted (see Table 16), and the model exhibited extremely good fit. With the exception of one of the concrete support loadings, the loadings on the latent variables were extremely high, indicating that more than half of the variance of the item is explained by the respective protective factor. These findings suggest that the items in all of the scales—family functioning, social support, concrete support, and nurturing and attachment are tapping the protective factors they were intended to measure.

With respect to Question 2, the measurement model explored the underlying relationships of the protective factors within time points. Overall, the relationships were in the directions predicted. Within time correlations between factors ranged from .067 to .472. However, relationships between the protective factors were not as

strong as predicted. For example, family functioning and social support were hypothesized to be highly correlated. The two factors exhibited moderate relationships at Time One and Time Two. Social support and concrete supports were hypothesized to be moderately correlated. Within time points, however, relationships were low. Social support and nurturing and attachment were predicted to be highly positively correlated, however in the models, the correlations were moderate at best. To further explore the relationships between the protective factors, a structural model was conducted to determine if scale scores at Time One were predictive of scale scores at Time Two. Although factors were correlated and exhibited weak to moderate relationships, only the score on the subscale itself at Time One was predictive of the score at Time Two. When within time correlations were controlled for, all other structural paths were not statistically significant. In other words, a high score on nurturing and attachment at Time One is not predictive of high scores on concrete support or any of the other scales at Time Two. This is of note because it suggests that although related, the PFS measures distinct constructs.

Invariance testing with increasingly constrained models was conducted to determine if the underlying factor structure of the PFS remained stable across time (Question 3). That is, do participants understand and respond to the PFS questions in the same manner when taking the PFS prior to receiving services and at the completion of services? Based on the results, the PFS functions in the same manner regardless of if it is a pre-test or a post-test. When both the loadings and the correlations between the constructs were set to be equal, the model fit was essentially

the same, indicating that the model measures the protective factors in a similar manner at pre- and post-test.

Because an intervention occurred between time points, it was hypothesized that latent mean scores at Time Two would be higher than at Time One. The Confirmatory Factor Analysis did not support that hypothesis. When latent means were equated, the change in model fit was .01, which meets the threshold for a difference in models. Additional tests were conducted to focus individually on the scale scores. In four separate sub-models, each of the latent means was equated across time points. If the latent means were equated, but the data reflected a change in scores, then the model fit should have become worse. In this case a “worse” model fit would signify that there was a change in mean scores perhaps as a result of an intervention such as parent education. That did not happen. Essentially, there was no change in model fit for any of the latent mean scores from Time One to Time Two.

Although the model fit in these tests fell within the Comparative Fit Index (CFI) change of less than .01, it must be noted that there was some change in the latent means scores. To gain another perspective and enable reporting of effect sizes, comparison tests from Time One to Time Two were conducted in SPSS. In each of these tests, changes from pre to post were statistically significant, albeit exhibited weak to small effect sizes. Thus, there are two conflicting perspectives on whether there were increases in the protective factors from Time One to Time Two. The incongruity of the change scores is discussed in detail in the following section and

suggests that future research should focus on the intervention and include controls for frequency and duration of services and fidelity of the intervention.

Internal consistency of the subscales (Question 4) supports previous research. Three of the subscales exhibit high internal consistency (family functioning, social support, and nurturing and attachment). Concrete support continues to fall below the desired .80 threshold.

Discussion

The results of each research question and hypothesis that were presented in Chapter 3: Results are discussed in detail in the following section. The overall question “To what extent is the PFS a valid and reliable instrument of multiple protective factors” is addressed by considering each question and hypothesis individually, tying it back to the literature, and exploring potential reasons for the findings.

Research Question 1: To what extent do the items (manifest variables) in the PFS define the protective factors constructs (content validity and reliability)?

CFA enables the researcher to psychometrically evaluate an instrument’s conceptual foundation. In the CFA model in this study, the researcher examined factor loadings to assess each item’s reliability to measure the hypothesized protective factor.

Squaring the standardized factor loadings indicates the amount of variance accounted for in the latent variable by each item (Brown, 2006). A standardized factor loading above .7 means that over half of the variance of that item is explained by the hypothesized factor. The following section discusses the factor loadings in the PFS

and notes that all standardized loadings, with the exception of one concrete support item, are evidence of the items' reliability (Brown, 2006). Content validity concerns the representativeness of the items to measure or capture the construct. Although it is not possible to evaluate content validity statistically, the literature review and reliability of the indicators support the content validity of the PFS. The literature review supported the operational definition and writing of the items, which were then tested in the measurement model.

Hypothesis 1: The manifest variables will load highly on the appropriate factors. This hypothesis was supported by the loadings in the CFA. As mentioned previously, items comprising three of the subscales exhibited extremely high loadings that suggest that the items are tapping the intended protective factors. The family functioning loadings ranged from .727 to .873 at Time One and .732 to .876 at Time Two. They were written to tap items that describe a family's adaptive skills and strategies to operate and persevere in times of crisis. Specifically, items measure the family's perceived ability to solve problems, listen to each other, and overcome adversity. The social support loadings ranged from .789 to .853 at Time One and .802 to .853 at Time Two. Items were intended to measure the parent or caregiver's perceived availability of informal and emotional support from family and friends. Results indicate that the items function as intended. Nurturing and attachment items ranged from .696 to .832 at Time One and .655 to .825 at Time Two. These items were designed to capture the parent or caregiver's perceived emotional tie and

positive interaction between them and their child. The high factor loadings suggest that the items function as intended.

Concrete support loadings ranged from .466 to .833 at Time One and .455 to .836 at Time Two. Items were written to measure the parent's awareness of and ability to utilize tangible goods and services that could help them cope during times of need. Specifically, the PFS examines three types of concrete support—where to go to secure food or housing, where to go to secure cash assistance to help pay bills, and where to go to find employment. The first two loadings were high, however the third one was markedly lower than all the others in the instrument (.466 and .455 respectively). Within the context of the current economy, this item may be interpreted differently than when it was originally conceptualized in 2006, when the economy, as measured by Gross Domestic Product (GDP), was growing (Bureau of Economic Analysis, 2010). GDP is an indicator of the overall health of the economy (Amadeo, 2010), and beginning in the third quarter of 2008, the GDP started showing signs of a struggling economy—as demonstrated by four consecutive quarters of declines (Bureau of Economic Analysis, 2010).

Specific to this study's participants, the unemployment rate in Nevada exceeded 13 percent during the study period (U.S. Bureau of Labor Statistics, 2009). This fact may have influenced the responses on the item about employment options. In the past, employment agencies, workforce centers, and other job services may have been a logical place to turn when one was out of work. However, in the current economy, participants may have perceived that there were no easy answers or jobs to

be had. The lack of available jobs and high number of qualified unemployed workers may have confounded the responses on this item.

Research Question 2. What are the underlying relationships among the protective factors as measured by the items in the PFS (convergent validity)?

Research and theory suggests a complex, multi-faceted, and interactive relationship between these concepts (Jack, 2000; Dunst, 2000; Brofenbrennor, 1986).

Hypotheses 2a, 2b, and 2c explored relationships between social support and family functioning, concrete support, and nurturing and attachment. Social support is a popular aspect of prevention approaches and programs. It is not well understood, however, how social support is influenced by prevention strategies and affects behaviors that result in a reduction in maltreatment (Budde & Schene, 2004). Budde and Schene (2004) suggest an evaluation agenda to explore interventions that target social support as an outcome. Evaluation questions would include: 1) Do social support interventions result in higher levels of social support and other related behaviors? 2) How do social support interventions contribute to violence prevention mechanisms (improved parenting and reduced stress)? 3) How does the economic context influence social support interventions and outcomes? and 4) How do relationships change as a result of social support interventions? The present study does not provide definitive answers to these questions but does contribute to what is known about parent education programs infused with the Strengthening Families approach. Specifically, this study documents the strength of relationship between social support and family functioning, concrete supports, and nurturing and

attachment. Although relationships were not as strong as hypothesized, they are noteworthy.

Hypothesis 2a: Family functioning and social support will be highly positively correlated (Jack, 2000). Family systems theory (Walsh, 2002), the ecological model (Jack, 2000; Bronfenbrenner, & Crouter, 1983), and social systems theory (Dunst, 2000) acknowledge a relationship between social support and family functioning. The nature of that relationship is understood to be highly complex. In addition to an interactive, positive relationship between the two factors, social support has been explored as a method of predicting or mediating family functioning (Armstrong, Birnie-Lefcovitch, & Ungar, 2005). Using hierarchical multiple regression analyses, researchers found that although results supported the literature, social support had less mediating effects on family functioning than expected (Dunst, Trivette, & Cross, 1985). Social support had more influence on personal well-being and attitudes towards their children than family functioning. Authors concluded that the relationships between social support and family and child outcomes were multifaceted and complex.

In a study on ecological correlations and their ability to predict family functioning, researchers explored relationships between parents' demographic characteristics, social relationships, and mental health and their ability to predict family function. Mixed-methods, including self-report, caseworker ratings, and researcher observation were used to assess the participants' level of family functioning. As predictors of family functioning, these variables performed in the

expected direction. However, social support played a minor and insignificant role as a predictor of family functioning (Meyers, Varkey, & Aguirre, 2002).

The present study supports previous theoretical assumptions and contributes to the research base of the strength of the relationship between the two factors. The researcher hypothesized a highly positive correlation, however the hypothesis was not supported. Results registered a moderate relationship between the factors at Time One (.472) and Two (.429). Interestingly, social support at Time One did not predict family functioning at Time Two, which supports the research discussed above and notes a minor role of social support in the prediction of family functioning. Family functioning at Time One did not predict social support at Time Two. This finding was consistent with the literature, which posited a uni-directional predictive relationship between social support and family functioning.

Hypothesis 2b: Social support and concrete supports will be positively moderately correlated (Coohey, 1996). As defined earlier, social support is multi-faceted and includes both structural and functional components such as emotional, instrumental, or informational support (Thoit, 1982; Cameron, 1990; Gottlieb, 1983; DePanfilis, 1996). The present study focuses on the functional aspects of social support. For the purposes of this study and alignment with Center for the Study of Social Policy's protective factors, emotional support is called social support and instrumental support is called concrete support. The majority of research focuses on social support as a mediator or moderator variable (MacLeod & Nelson, 2000; Meyers, Varkey, & Aguirre, 2002; Dunst, Trivette, & Cross, 1986), with less

attention paid to the effects of concrete support (MacLeod & Nelson, 2000). A study of intergenerational maltreatment identified protective factors that differentiated individuals who broke the cycle of violence from those who perpetuated it. These factors were financial support (concrete) and social support (Dixon, Browne & Hamilton-Giachritsis, 2009). Documentation of the relationship between the types of support, however is lacking. Coohy (1996) surmised that when social support is minimal—that is fewer individuals, fewer contacts with them, and less proximity—there are fewer opportunities to receive instrumental support such as material resources or help with child care, housework, etc. Following this reasoning, the higher the social support, the higher the concrete support would be.

Results of this study support a positive, albeit, a weak relationship between social and concrete support (Time One: .270; Time Two: .233). Although results do not support the hypothesized moderate relationship, the study contributes to the literature and suggests a tenuous relationship. When looking at the structural model, neither type of support at Time One (social or concrete) predicted the other at Time Two. This finding may mean that although weakly related, perceived social support does not lead to perceptions of knowing how to access needed resources. Conversely and although not suggested by the literature, in this study, the perception of having material resources does not dictate how supported one feels. As mentioned earlier, this finding may be confounded by the economic downturn and context during which the study occurred. During more affluent and stable times, perhaps the perception of

resources available from a social network and from more formal sources such as social agencies would be greater.

Despite these turbulent economic times, the perception of social and concrete support was high (slightly to mostly agree). The findings of the present study are important because in spite of economic times, it appears that in general, families feel supported emotionally and know where to go to get the resources they need.

Hypothesis 2c. Social support and nurturing and attachment will be highly positively correlated (Crockenberg, 1981). Of infant temperament, maternal responsiveness, and social support, the latter was the greatest predictor of nurturing and attachment (Crockenberg, 1981). The researcher based the hypothesis on this early work from the 1980's and strived to replicate the findings. The current study neither supports the hypothesis nor Crockenberg's uni-directional, predictive relationship. The strongest relationship, characterized as moderate (Cohen, 1988) between social support and nurturing and attachment was found at Time One (.354). At Time Two, the relationship approached moderate but was smaller (.270). Predictive relationships were non-significant.

A study of the relationship between social networks and infant-mother attachment did not confirm Crockenberg's findings (Levitt, Weber, & Clark, 1986). Spousal and other support were not related to the bond developed by the mother and infant. These findings and the present study support evidence of a complicated web of factors that influences the bond between mother and child. A meta-analysis of 66 studies explored parental antecedents of infant attachment and concluded that the

early relationship between mother and child can be influenced by changes in maternal sensitivity, marital conflict, life events, and environmental factors (DeWolff & Van Ijzendoorn, 1997).

It must also be noted that the majority of research focuses on maternal attachment of the infant and child. The present study included not just mothers, but also fathers and other caregivers of a child under the age of 18. Prior to the nurturing and attachment questions in the PFS, the question was asked, “What is the age and date of birth of the child you hope will benefit most from your involvement in our services?” To more comparably explore the relationship between social support and nurturing and attachment as explored in the previously mentioned studies, it would be necessary to run the same models or correlations with a subset of parents and caregivers with children under 12 months of age. However, in the current study this was not possible because the variable on age of child lacked reliability and validity. Many of the parents and caregivers in the study had multiple children. Although the parents self-reported the child they were thinking about when answering the PFS questions about nurturing and attachment, it was not possible to verify that they were able to isolate their thinking and only report on their relationship with that particular child.

Also, some of the responses may have been subject to social desirability. For example, item 17, “I am happy being with my child” exhibited moderate skew and kurtosis. This may have been because parents and caregivers believe that societal norms would expect them to enjoy being with their child. Again, responses on this

item may be affected by the age of the child, with parents of infants and parents of teenagers answering differently. An observational instrument and analysis by age of child would help tease out these questions and will be further discussed in the limitations and future research sections.

Research Question 3: To what extent does the underlying structure of the PFS remain stable across time? In other words, does the PFS measure the same concepts or in this case, protective factors, regardless of time administration? To determine stability or “sameness” psychometrically, invariance was examined by equating or constraining various elements of the model and then seeing how much the fit changes. If the models are the same, changes in the CFI fit index should be small (less than or equal to .01) (Cheung & Rensvold, 1999). However, if the change in CFI is greater than .01, that means the models are not the same. In the case of longitudinal research or pre-post, such a finding would indicate that the instrument is not stable and functions differently at pre-post.

The stability or partial invariance of an instrument is important in the use of longitudinal research that uses experimental or quasi-experimental designs to compare treatment effects on one group to effects on another. Without evidence of stability, results may be confounded and interpretation inaccurate (Pentz & Chou, 1994). Further, an instrument would not be considered stable or reliable across time points, therefore could not be trusted to measure changes in factors as a result of intervention. Hence, for the PFS to be used to evaluate a program’s effectiveness to

strengthen protective factors in parents and caregivers, it was critical to establish metric invariance of the PFS at pre- and post-administration.

However, total measurement invariance beyond loading and correlational invariance was neither expected nor desired in the present study. In longitudinal research involving subjects and an intervention, changes in latent mean scores would indicate that the intervention or some mediating factor was related to those change scores. Therefore, if invariance was tested, model fit would be expected to worsen. That is, because changes occurred in the latent means, when equating them in the invariance testing, the model would not fit as well as before (Pentz & Chou, 1994).

The present study explored two types of measurement invariance to determine if the psychometric relationships between the observed items and latent constructs were consistent across time points. If the scales function consistently across time points, fit should be essentially the same. In this instance, “sameness” is defined as differences in CFI fit of equal to or less than .01 (Cheung & Rensvold, 2002). As described in more detail below, the PFS is stable across time points and could be used longitudinally. That is, the constraints in the loading invariance and equality of correlations stability models did not result in changes in model fit.

Hypothesis 3a: The factor loadings for each construct will remain stable across time. Hypothesis 3a in the current study explored item-level metric variance or whether the strength of the relationship between each item in the PFS and the factor is the same at both time points. For ease, this testing of invariance is referred to as Loading Invariance in Table 15. In the CFA model in Figure 2, the loadings or

arrows coming from FFT1 were equated to those of FFT2 and so on for each set of loadings and factors. The change in CFI was .004, indicating that for all practical purposes, the loadings can be considered to be the same from Time One to Time Two. Another way to compare the loadings is to visually compare the standardized loadings for each factor from Time One to Time Two in Table 16. Minimal differences can be detected. The invariance testing in the CFA confirms these observations statistically. Given that some researchers say that this type of invariance is difficult to attain (Byrne, Shavelson, & Muthen, 1989; Marsh & Hocevar, 1985), the results of this study provide evidence that the items in the PFS consistently associate with the theoretically-hypothesized constructs regardless of time point administration.

Hypothesis 3b: The relationships between the constructs will remain stable across time. Hypothesis 3b in the present study explored equivalence of construct covariance. This type of invariance testing explored whether the relationships or covariance between latent constructs are the same at Time One and Time Two. In other words, the relationships between the protective factors were explored to see whether they were consistent across time points. In the CFA model in Figure 2, the bi-directional arrows between the factors at Time One were made equal to the bi-directional arrows between the factors at Time Two. This type of invariance is critical and must be supported before researchers can compare relationships across time points or groups (Byrne, 1994; Jackson, Wall, Martin, & Davids, 1993; Marsh, 1993). In the present study, after constraining the covariance, the change in CFI was

less than .001, suggesting that the relationships or covariance between the protective factors are the same regardless of administration time. As mentioned previously, this type of invariance is necessary before change scores in the latent means can be compared across time points and across groups. Without this type of invariance, change scores and effect scores cannot be trusted. Thus demonstrated, latent mean scores were examined in Hypothesis 3c through two methods.

Hypothesis 3c: Latent mean scores will differ from Time One to Time Two.

Once instrument stability is established, it is possible to evaluate change scores as a result of interventions (Pentz & Chou, 1994). While invariance was expected in the aforementioned models (Hypothesis 3a and 3b), it was not expected when equating the latent means. In the present study, participants received some type of parent education program coupled with Strengthening Families strategies between the pre-test and the post-test. Because of the intervention, an increase in the protective factors was expected from Time One to Time Two. No change in model fit when the means are set to be equal would mean that there is little or no change in the protective factor scores from Time One to Time Two. The models were essentially the same in the CFA (change in CFI=.01), suggesting that there was relatively little change as a result of the parent education programs. It must be noted, however, that the change in CFI was at the maximum range of what Cheung and Rensvold (2002) set as the value for not rejecting the null hypothesis of invariance.

To further explore changes in latent scores, four additional constrained models were run, individually setting each latent mean to be equal. Each test supported the

assertion of no change (Change in CFI: Δ CFI=.002, Δ SS=.001, Δ CS=.006, Δ NA=.002).

Although these changes in CFI indicate that there is minimal change in the overall fit, hence little change in mean scores, it does not allow easy interpretation. For that reason, effect sizes were calculated in SPSS for each factor. Cohen's d was computed for each scale score. On three of the scale scores, effect sizes were below Cohen's threshold of a small effect (social support $d=.17$, concrete support $d=.14$, and nurturing and attachment $d=.22$). Family functioning, however, demonstrated a small effect size ($d=.33$). While these effect sizes are not monumental, they are acceptable for the present study for a couple of reasons. First, the present study was a measurement piece and did not focus on or control for variations in frequency and duration of services or fidelity of the parent education programs. Second, the effect sizes are within the range of reported effect sizes for the recent Center Disease Control (CDC) meta-analysis of parent education (Kaminski, et al., 2008). In the CDC study of 77 programs that focused on parent education or training, effect sizes ranged from .13 to .88. The results of the present study fall within that range. Finally, the family functioning effect size is comparable to that found in Geerart et al.'s study of parenting education programs between 1975 and 2002, which found a small effect size on family functioning ($d=.29$).

The incongruity of the change score results from the CFA and SPSS analyses overall suggest that if there was any change in the protective factors from pre to post, it was minimal. One explanation for this finding is that the parent education interventions themselves may not have been strong enough to result in substantive

change in protective factors from Time One to Time Two. Also, the infusion of Strengthening Families may not have additive effects on parent education programs. Without controls for frequency and duration of services and fidelity of the parent education intervention and the adherence level to Strengthening Families' strategies, it is not possible to make conclusions about change scores. The establishment of the PFS as a psychometrically sound instrument to measure multiple protective factors provides a resource to examine change as a result of interventions and is discussed more fully in the implications for practice and future research sections.

Research Question 4: What is the internal consistency of the items in each of the subscales? When measuring a concept, it is important to know that the items within the scale consistently reflect the construct, or if they are reliable. A common way to evaluate internal consistency is through Cronbach's (1951) alpha. This statistic provides a coefficient ranging from 0 (no reliability) to 1.0 (perfect reliability) that demonstrates item-to-item consistency of a scale (Kline, 1998). The amount of variance explained by the type of reliability under study can be determined by subtracting the Cronbach alpha from 1.0. For example, the internal consistency on the family functioning scale was .90. This means that only 10 percent of the variance of this scale is caused by random effects of content heterogeneity (Kline, 1998). There is no definitive gold standard for this scale, however, .90 is considered excellent, .80 very good, and .70 adequate (Kline, 1998). While .70 is adequate, the authors of the PFS desired high internal consistency exceeding .80.

Hypothesis 4: Internal consistency for each subscale will exceed a

Cronbach alpha of .8. According to the standards referenced above, the family functioning scale demonstrated excellent internal consistency (.89, .90), while social support approached excellence (.86, .88). Nurturing and attachment exhibited very good internal consistency (.84, .82). Although not as strong, the Cronbach alpha for concrete support met Kline's (1998) definition of adequacy at both time points (.73, .72).

In the research on the PFS to date, the concrete support subscale does not meet the threshold of internal consistency desired. One potential reason for this could be that the three items in the scale are all negatively worded. Including positive and negatively worded items in survey instruments is meant to overcome response bias. Respondents tend to agree with more with positively worded items than negatively worded items (Cronbach, 1951). Balanced approaches that include positive and negatively worded items are intended to overcome this tendency and to keep the respondent's attention on the content under study (Anastasi, 1981). However, a substantial body of research suggests that negatively worded items may result in a methods effect that diminishes the internal consistency of the scale (Schriesheim, Eisenbach, and Hill, 1991). One potential reason for this is that negatively worded items are not necessarily interpreted as the polar opposite of positive items (Barnette, 2000). To overcome the loss in internal consistency and subsequent reduction in validity of the scale, Barnette (2000) recommends against using negatively worded items, instead using positive or directly worded items and

then varying the order of the responses. Stated differently, the responses could be ordered differently from strongly dislike to strongly like and then from strongly like to strongly dislike. Changes in the progression of the responses should be clearly marked.

Limitations

While the PFS has demonstrated reliability and validity, some limitations must be noted, including the internal consistency of the concrete support scale, limited criterion-related validity, reliance on self-report, social desirability of the nurturing and attachment items, lack of an experimental design, and sample issues. Although considered adequate by some standards (Kline, 1998), the internal consistency of the concrete support subscale is not on par with the other subscales in the PFS. The negative wording of the items, coupled with the potential contextual influence of the item about where to seek help finding a job, suggest caution when interpreting findings.

Contributions to the validity of the PFS through this study are limited to content and convergent validity. Because the State of Nevada only assessed protective factors as an outcome of parent education programs, only an examination of convergent validity was feasible in this study. Evidence of convergent validity was provided by examining the hypothesized relationships between the protective factors, which were in the direction predicted. The use of only the PFS could result in mono-method bias, which occurs when only one method or instrument is used to measure an

outcome (Trochim, 2006). With only one measure, it was not possible to verify that the PFS is fully measuring the protective factors. Although discriminant validity with measures of risk factors has been demonstrated in previous studies, the lack of risk measures in the present study did not contribute to the body of evidence.

The Protective Factors Survey relies on self-report to measure the parent's or caregiver's perception of the presence of family functioning, social support, concrete support, and nurturing and attachment in their own life. The findings in this study may be different from how parents actually behave in certain situations. Pairing the PFS with an observation tool such as the HOME (Caldwell & Bradley, 1984) would lead to a stronger design and contribute to validity. This limitation, however, may not be as large of an issue as in other cases of self-report because it is the perception of social support and nurturing and attachment that are the strongest predictors of maltreatment rather than the quality or quantity of either factor.

Interpretation of the nurturing and attachment scale should also take into account distribution non-normality, potential social desirability, and the difficulty of isolating one child when answering the questions. The moderate skew and kurtosis of one item in the nurturing and attachment scale, "I am happy being with my child" should be considered when interpreting factor scores. The nonnormality may be a result of social desirability, since most people may think it is expected and desired that they enjoy spending time with their child. It also does not account for how those societal expectations may differ for parents of infants, as compared to parents of

teenagers. The unreliability of the variable on the child's age in the survey did not allow for further examination of sub-group differences.

This study was a measurement piece to examine the psychometric properties of the PFS. One of the research questions explored latent mean differences. The hypothesis was that there would be an increase in post scores as a result of the parent education intervention, which included Strengthening Families. While interventions were not a focus in this study, an experimental design that controlled for frequency and duration of services and fidelity would have provided more insight on the PFS' sensitivity and ability to document change over time. The lack of change scores could mean that the interventions were not strong enough to register effect sizes. Without assessing elements of implementation such as frequency and duration of services and fidelity, it is not possible to assess whether the instrument is not sensitive enough to document changes or whether the interventions do not result in substantive changes in protective factors.

In addition to the lack of controls for frequency or duration of services and fidelity, the disparity in program completion rates from agency to agency may also be an issue. Agency completion rates ranged from zero to 100 percent, suggesting that there may be factors specific to the agency that support retention or in converse, contribute to attrition.

Implications for Practice

The protective factors are gaining momentum as a necessary and productive approach to child maltreatment prevention because protective factors benefit all

families, help build positive relationships with service providers, and draw on natural support systems that contribute to long term success (Child Welfare Information Gateway, 2009). However, despite broad adoption of the protective factors philosophy, there remains a gap in the research to document its effectiveness to increase protective factors in families and ultimately lead to a sustainable reduction in child maltreatment. The present study contributes to the knowledge base of protective factors and has implications for the field as a paradigm and tool for evaluation and research. As mentioned in the Introduction, programs organized around a predominantly-focused risk model may encounter practice constraints such as limited reach, stigma, a small window of entry for intervention, and the static nature of some risk factors. A protective factors approach addresses these practice challenges, but programs have lacked valid and reliable instruments to measure protective factors as defined by the Strengthening Families Initiative. The PFS addresses that need.

To document effectiveness, programs must have a way to measure changes in multiple protective factors as a result of services. As mentioned earlier, once instrument stability is established, it is possible to evaluate change scores as a result of interventions. Currently, programs targeting multiple protective factors have to piece together several instruments to assess effectiveness. This study establishes the PFS as a valid and reliable instrument with parent education programs and provides community-based staff and researchers with an affordable and easy-to-administer tool that measures multiple protective factors. Because it was aligned with the CSSP

model, the PFS can be used by CBCAP programs and others adopting the Strengthening Families approach to begin to develop an evidence base for the protective factors as a prevention paradigm.

Because of the evidence provided through four field tests and the present study, the PFS has well-documented psychometric properties and can now be used with confidence as an evaluation and research tool. The PFS can serve both formative and summative functions. The formative function enables service providers a reliable and valid assessment instrument that can inform practice decisions. Given prior to services, the PFS provides a snapshot of the presence of protective factors in the families being served. Staff can utilize the data to identify target areas and to select strategies that are aligned with the protective factor levels of their clients. Analysis of subscale scores gives programs a detailed look at the types of changes participants are experiencing as a consequence of program participation. Program staff can also use the tool for continuous improvement purposes. In conjunction with program implementation data, PFS data can be utilized to highlight effective practices or identify areas in need of improvement.

As a summative measure, the PFS can be used to assess effectiveness. The administration of the instrument at the beginning and end of services provides programs with information about changes in protective factors and enables researchers to calculate effect sizes. In order for programs to assess whether the Strengthening Families approach makes a difference when added to an evidence-based program, a reliable and valid instrument tool that aligns with the identified

protective factors was needed. This study provides evidence of the validity and reliability of the PFS for the field. As described below, the PFS can be used to begin addressing the critical question of whether the Strengthening Families approach adds value to evidence-based programs or dilutes the effects. Finally, the documentation of protective factors will enable programs to determine if changes in the presence of these protective factors moderates the relationship between risk factors and abuse.

Future Research

Although this study contributes to the reliability and validity of the PFS as a tool to measure the presence of multiple protective factors in parents and caregivers, more research is needed to establish the instrument in the prevention field. Several areas of research would add to the protective factors knowledge base and the ability of the PFS to capture changes as a result of services, especially those infused with Strengthening Families.

The demographic variables, specifically frequency and duration of services, and age of child, should be revised to explore possible mediating or moderating relationships between them and the protective factors. Convergent validity needs to be addressed by exploring relationships between the PFS and other measures of individual protective factors (Table 2). Instruments should be carefully examined and selected to mirror the essence of the protective factors as operationalized in the PFS and reflect the literature review. For example, it is not the quantity nor the quality of social support that is important in the prevention of maltreatment. It is the perception of the availability that matters most. Thus, to assess convergent validity,

constructs in instruments would have to be similarly defined. Adding an observation tool such as the HOME (Caldwell & Bradley, 1984) or NCFAS-G (Reed-Ashcraft, et al., 2001) to future studies would also allow comparison of the PFS as a self-report instrument with practitioner ratings. In the case of nurturing and attachment, an observation tool could overcome the social desirability bias that may be present in the nurturing and attachment items. Results could inform future revisions of those items.

Previous studies have documented the predictive validity of the PFS on risk factors; however, the predictive validity of the PFS to reduce maltreatment has not been explored. If the protective factors in the PFS reflect the research, then it is hypothesized that families with high levels of protective factors are less likely to abuse their children. This elusive question is the crux of prevention programs and one that needs to be addressed. A predictive validity study is needed to determine the relationship between PFS factor scores and confirmed cases of abuse and neglect.

The PFS has now been tested with home visitation and parent education programs and has proven to be a valid and reliable tool with these populations. The PFS is a psychometrically-sound instrument that could be used in experimental designs to evaluate whether such prevention programs result in increases in protective factors. A rigorous research design using evidence-based programs could evaluate the sensitivity of the PFS to document change over time. Additionally, research should explore “how much” Strengthening Families is enough to influence positive parent outcomes and lead to a reduction in child maltreatment. Although Strengthening Families makes strong intuitive sense and the individual protective

factors are supported in the research, the question "Does Strengthening Families have an additive or dilutive effect when paired with evidence-based programs?" must be posed. To do this, Strengthening Families must be quantified. Parsons (2009) identifies several domains of influence where the Strengthening Families framework can be applied—policy, formal and informal organizational connections, professional development for practitioners, programs and activities, and changes in families' use of protective factors. These domains operate on a continuum, and once a tipping point or threshold is reached, non-linear, systemic changes begin to occur. To capture these changes and document them statistically, several things must happen. First and foremost, the amount of Strengthening Families within a program must be articulated. Next, frequency and duration of services and fidelity of the evidence-based program must be examined and documented. These items and others could be included as covariates in Structural Equation Models to explore the effectiveness of parent education programs to influence protective factors and ultimately reductions in child maltreatment.

Finally, to address the changing demographics of service populations, it would be beneficial to translate the PFS into other languages to tap protective factors in other cultural-linguistic groups and determine what, if any, cultural-linguistic group differences exist in these factors. The changing demographics of the United States require that instruments are available in multiple languages.

In the present study, there was a significant need for a Spanish version, since over 25% of the parent education participants were native Spanish speakers. Based

on this demand, the PFS was translated into Spanish by a native speaker, who was a bi-lingual human service counselor working with parent education programs in Nevada. The translation was vetted with bilingual program staff at 16 agencies in the State. While the literature supports similar constructs in Latino populations (Coohey, 2001), no psychometric testing was conducted on the Spanish version used in the Nevada sample. This lack of testing is problematic for several reasons. First, the translation may not be accurate in capturing the essence of the protective factors. Second, the factors may not function in the same way in Spanish as in English. If this is the case, the results do not mean the same thing for English and Spanish clients. The reliability and validity of a Spanish tool must be established. Future studies should utilize structural equation modeling to conduct a two-group longitudinal confirmatory factor analysis and structural regression of the English and Spanish versions of the PFS. Such a study would compare the models of each language version to determine if the factor structures have measurement equivalence.

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Appendices

Appendix A

Participant organizations in development of the Strengthening Families Protective Factors

Organization and Description

Community Based Child Abuse and Neglect Prevention Programs (CBCAP) is a federally funded program to prevent child maltreatment. The purpose of CBCAP is two-fold: 1) support community-based efforts to develop, operate, expand, enhance, and support networks that coordinate resources to strengthen and support families and reduce the likelihood of child abuse and neglect, and 2) foster an understanding, appreciation, and knowledge of diverse populations to prevent maltreatment (National Resource Center for Community Based Child Abuse Prevention, 2007).

Child Trends: Child Trends is a nonprofit, nonpartisan research center that studies children at all stages of development. The center's mission is to improve outcomes for children by providing research, data, and analysis to the people and institutions whose decisions and actions affect children, including program providers, the policy community, researchers and educators, and the media (Child Trends, 2010).

The Child Welfare League of America (CWLA) is the nation's oldest member-based child welfare whose mission is to lead the country in building public will to ensure safety, permanence, and well-being of children, youth, and their families by advancing public policy, defining and promoting practice excellence and delivering superior membership services (.Child Welfare League of America, n.d.)

Family Support America is a national organization that provides information and support to families on child maltreatment prevention, substance abuse, disciplining children, and divorce (Family Support America, 2007).

Free to Grow was a national demonstration program of Head Start programs to explore innovative approaches to reduce two public health problems—substance abuse and child maltreatment. The organization identifies promising ideas and practices in the field of maltreatment prevention and brings together community partners to use community-specific integrated approaches to strengthen families and the community. The organization closed in April, 2007 (Free to Grow, 2007).

The National Alliance of Children’s Trust Funds is a membership organization of Children’s Trust and Prevention Funds and provides training, technical assistance, and peer consulting opportunities to its members to prevent child abuse. The organization supports CBCAP states to promote community-based strategies to prevent maltreatment and strengthen families (National Alliance of Children’s Trust Funds, 2008).

The National Association of Education for Young Children (NAEYC) is dedicated to the well-being of all young children and focuses on quality education and developmental services for children from ages birth to eight (National Alliance of Education for Young Children, n.d.)

The National Association of Child Care Resource and Referral Agencies (NACCRRA) is an organization to provide voice for child care providers nationally and works with over 700 child care resources and referral agencies across the nation. The association leads projects that increase quality and availability, conduct research, and advocate for child care policies to ensure that families have access to high-quality, affordable child care (National Association of Child Care Resource and Referral Agencies, 2010).

The National Child Care Association provides a voice for private, licensed child care and early education providers across the nation. The Association represents the needs and specific interests of private providers. (The National Child Care Association, n.d.).

Prevent Child Abuse America is a national organization with 41 state chapters that focuses on reframing prevention, engaging communities, and promoting public policies to prevent child maltreatment. The organization promotes healthy child development as a building block for community and economic development.

USA Child Care: USA Child Care was a national association of child care centers (now defunct). Mission statement: USA Child Care is an organization for child care providers who believe that all children deserve high quality care. Our mission is to bring the voice of direct services providers to national and state policy dialogue.

Zero to Three is a national non-profit organization headquartered in Washington, DC with a mission to promote the health and development of infants and toddlers. This is accomplished by translating research and knowledge – specifically information about the kinds of early experiences that help children thrive – into a range of practical tools and resources for use by the adults who influence the lives of young children.

Appendix B

Protective Factors Survey User Manual

The Protective Factors Survey

User Manual



FRIENDS National Resource Center for Community Based Child Abuse Prevention
A Service of the Children's Bureau

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The Protective Factors Survey

A guide to administering the Protective Factors Survey

March 2008

Prepared by the Institute for
Educational Research and Public
Service at the University of Kansas



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Introduction

Though there are numerous instruments designed to measure individual protective factors, there is not currently a single instrument that assesses *multiple protective factors* against child abuse and neglect. In 2004, The FRIENDS National Resource Center for Community-Based Child Abuse Prevention began a project to develop a Protective Factors Survey (PFS) for its network of federally-funded Community Based Child Abuse Prevention (CBCAP) programs. This project was initiated to help programs better assess changes in *family protective factors*, a major focus of prevention work.

The PFS is a product of the FRIENDS Network in collaboration with the University of Kansas Institute for Educational Research and Public Service. The instrument was developed with the advice and assistance of researchers, administrators, workers, and experts specializing in family support and maltreatment and psychological measurement. The survey has undergone three national field tests.

Purpose and Use

The PFS is designed for use with caregivers receiving child abuse prevention services. The instrument measures protective factors in five areas: family functioning/resiliency, social emotional support, concrete support, nurturing and attachment, and knowledge of parenting/child development. Workers can administer the survey before, during, or after services.

The primary purpose of the Protective Factors Survey is to provide feedback to agencies for continuous improvement and evaluation purposes. The survey results are designed to provide agencies with the following information:

- A snapshot of the families they serve
- Changes in protective factors
- Areas where workers can focus on increasing individual family protective factors

The PFS is not intended for individual assessment, placement, or diagnostic purposes. Agencies should rely on other instruments for clinical use.

Description

The Protective Factors Survey is a pencil and paper survey.¹⁷⁴The instrument is divided into two sections, the first section to be completed by a staff member and the second section to be completed by a program participant.

Protective Factors Survey – For Staff Use Only Form

The purpose of the Protective Factors Survey – For Staff Use Only Form is to gather demographic information about the participant. Program staff who are knowledgeable about the participant are asked to complete this section. The Staff Form contains two sets of questions: 1) participant's survey experience, including the administration date, supports provided, and language version used, and 2) program dosage, specifically participant's length of involvement and types of services received.

Protective Factors Survey

The Protective Factors Survey contains the core questions of the survey. This part is designed for program participants who have received or are currently receiving prevention services. In the demographic section, participants are asked to provide details about their family composition, income, and involvement in services. In the family protective factors section, participants are asked to respond to a series of statements about their family, using a seven-point frequency or agreement scale. The following table provides a brief summary of the multiple protective factors covered in the survey.

Protective Factors Covered in the PFS

Protective Factor	Definition
Family Functioning/ Resiliency	Having adaptive skills and strategies to persevere in times of crisis. Family's ability to openly share positive and negative experiences and mobilize to accept, solve, and manage problems.
Social Emotional Support	Perceived informal support (from family, friends, and neighbors) that helps provide for emotional needs.
Concrete Support	Perceived access to tangible goods and services to help families cope with stress, particularly in times of crisis or intensified need.
Child Development/ Knowledge of Parenting	Understanding and utilizing effective child management techniques and having age-appropriate expectations for children's abilities.
Nurturing and Attachment	The emotional tie along with a pattern of positive interaction between the parent and child that develops over time.

Section I

Instructions for Staff

Preparing the Survey
Administering the Survey

The PFS survey kit contains all the materials that staff will need to prepare the surveys. Although materials can be shared among staff, it is highly recommended that one person be responsible for preparing the survey materials for the agency. Agencies should prepare the surveys several days prior to survey administration, following the steps listed below:

1. **Prepare the Informed Consent Statement.** Staff will need to create an Informed Consent Statement to fit the consent requirements of their organization. Each agency probably has a protocol or statement for collecting data. Agencies should only use the statement approved by their agency or IRB. If agencies do not have an informed consent statement, an example is included in the survey kit (see Section IV). Agencies can modify this one or write their own.
2. **Create survey packets.** Using the master CD located in the survey kit, staff should make one copy of the survey materials for each program participant. Copies of the Informed Consent Statement should also be made. Staff should staple the survey materials together and double-check the page numbers to make sure survey questions are presented in the order as they appear on the electronic copy given to each agency.
3. **Put participant ID number on surveys.** A participant ID number is required to process the survey data. Agencies should use existing case/client ID numbers. This number will allow staff to administer the second round of surveys to the same participants. There are two places that the participant ID needs to be provided (on the cover sheet of the Protective Factors Survey – For Staff Use Only Form and on the first page of the Protective Factors Survey).

Administering the Survey

The survey will take approximately 10-15 minutes to complete. The survey should be administered in a comfortable setting at a time when participants are not easily distracted and can concentrate on the items. Staff are welcome to provide refreshments to participants as long as access to refreshments is not tied directly to completion of the survey.

The survey is designed to be administered in person. Surveys can be administered in a group setting or in one-on-one interviews. The role of staff in the survey process is to facilitate understanding, but not to tell participants how to answer. It is critical that staff members present the survey in a consistent way to all participants. We strongly recommend that staff review the

Below is a list of recommended steps for the survey process to ensure consistent data collection. These steps have been written for staff administering the survey in a group setting. Modifications can be made if a different format (i.e. interviews) is used.

- 1) **Hand out survey packets.** Each participant should receive a survey packet with his/her participant ID number at the top of the survey. Staff should make sure the participant ID number that is written on the packet corresponds with the participant.
- 2) **Introduce the survey.** Staff should introduce the survey by reading the introductory statement to participants (see “Introducing the Survey” on page 10). After the introduction, staff should give participants a few minutes to read the Informed Consent Statement and sign it if necessary.
- 3) **Provide alternative arrangements for non-participants.** Alternative arrangements should be provided to participants who decide not to complete the survey. This might include leaving early or providing other activities for them. Staff should discretely provide instructions to non-participants.
- 4) **Direct participants to the second page of the survey.** The survey starts on the second page of the packet for participants. Staff should instruct participants to skip the cover sheet (For Staff Use Only) and proceed to page one of the survey.
- 5) **Review general survey instructions with participants.** Staff should review general instructions with participants using the script provided in the manual (see “Reviewing Instructions with Participants” on page 11). It is important that staff provide instructions regarding identification of the target child to all participants.
- 6) **Start survey.** The participant demographic questions start on page one of the survey packet. Staff should instruct participants to begin the survey. If participants have questions about specific items, staff should provide assistance. Staff can utilize the paraphrasing provided in the manual (Section III) to answer questions.
- 7) **Collect surveys.** Upon completion, surveys should be collected from participants. If there were any unusual circumstances surrounding the survey administration, staff should note that on the survey.
- 8) **Complete “For Staff Use Only” Form.** The cover sheet of the survey contains the demographic questions that must be completed by a staff member familiar with the program participant. Instructions for completing the demographic questions are provided in the next section.

Section II

Survey Scripts

Introducing the Survey
Reviewing Instructions with Participants

Introducing the Survey

“I am going to ask you to complete a survey. This survey will help us better understand the needs of the families we serve. We want to provide the best services that we can to all of our parents and families, and this is one way to help us keep on track.

The survey contains questions about your experiences as a parent and your outlook on life in general. The content of the survey should cause no more discomfort than you would experience in everyday life. All of the information that you share with us will be kept confidential and you do not have to put your name anywhere on the survey. The services you receive will not be affected by any answers that you give us in this survey.

Do you have any questions about the survey?”

(Answer participant questions)

[FOR AGENCIES WITH INFORMED CONSENT
REQUIREMENTS]

“On the front page of the survey is an Informed Consent Form. This is a document for our records that will be kept separate from the survey. This document tells us whether or not you have agreed to participate in the survey. You do not need to take this survey if you do not want to and the services you receive will not be taken away or changed if you do not take the survey. Please take a few minutes to read the first page of the survey. When you are finished, please check off the appropriate box and sign the form.”

*(Check to make sure informed consent forms are completed
before proceeding)*

Reviewing Instructions with Participants

“This survey contains two different sections that you will need to complete. The first section asks for background information about you and your family. You may have already given us some of this information, and we thank you for giving it to us again today so that our survey information can be as complete as possible.

The second section asks about your parenting experiences and your general outlook on life. Please remember that this is not a test, so there are no right or wrong answers. You should choose the best answer for you and your family.

You will notice that the answer choices are on a number scale. Please respond by circling the number that best describes your situation. If you do not find an answer that fits perfectly, circle the one that comes closest.

There is one section in the survey that asks you to focus on the child that you hope will benefit most from your participation in our services. For these questions, it is important that you answer only with that child in mind. Please remember to fill in the space with the child’s age so that we can better understand your responses.

When you are finished with the survey you can pass it back to me. If at any time you have questions about the survey, just let me know and I can help you.”

Section III

Survey Clarifications

Clarifications on the “For Staff Use Only” Form
Paraphrasing Instructions

Clarifications on the “For Staff Use Only” Form

Agency ID

Please provide the name of your agency.

Participant ID#

Participants do not need to give their names, however a unique participant ID is necessary to process the survey. The participant ID number should be the case/client ID number that the agency uses to track the participant.

Is this a Pretest or Post test?

Please indicate whether the survey being administered is a pretest (given at the initiation of services) or a post test (given at the end of services).

1) Date survey completed

Provide the month, date and year that the survey was completed. Please use the four-digit year (for example, 2007 instead of 07).

2) How was the survey completed?

Please check the most appropriate response:

- “Completed in a face to face interview” if you met individually with the participant and filled it out together.
- “Completed by participant with program staff available to explain items as needed” if the participant filled it out with help from staff.
- “Completed by participant without program staff present” if the participant had no staff assistance.

3) Has the participant had any involvement with Child Protective Services?

Check the most appropriate box:

- NO if you know that the participant has not had involvement with CPS.
- YES if you know that the participant has had involvement with CPS.
- NOT SURE if you do not know whether or not the participant has had involvement with CPS.

4A) Date participant began program (complete for pretest)

Provide the month, date and year that the participant began receiving services from your program. Please use the four-digit year (for example, 2007 instead of 07).

4B) Date participant completed program (complete for post test)

Provide the month, date and year that the participant completed services from your program. Please use the four-digit year (for example, 2007 instead of 07).

5) Type of Services

Identify all of the services that the participant is currently receiving. If you do not find one that matches your program's services, select “other” and provide a two- to four-word description of the program.

6) Service Intensity

A. (COMPLETE AT PRETEST) Estimate the number of hours of service the participant will be offered during the program. You should add up the hours across all services that the participant receives.

B. (COMPLETE AT POST TEST) Estimate the number of hours of service the participant has received since he/she started the program. You should add up the hours across all services that the participant receives.

PROTECTIVE FACTORS SURVEY

FOR STAFF USE ONLY:

Agency ID _____

Participant ID # _____

Is this a Pretest? Post test?

1. Date survey completed: ____ / ____ / ____

2. How was the survey completed?

- Completed in face to face interview
- Completed by participant with program staff available to explain items as needed
- Completed by participant without program staff present

3. Has the participant had any involvement with Child Protective Services?

- NO
- YES
- NOT SURE

4. (A) Date participant began program (complete for pretest) _____ / ____ / ____

4. (B) Date participant completed program (complete at post test) _____ / ____ / ____

5. **Type of Services:** Identify the type of program that most accurately describes the services the participant is receiving. Check all that apply.

- Parent Education
- Parent Support Group
- Parent/Child Interaction
- Advocacy (self, community)
- Fatherhood Program
- Planned and/or Crisis Respite
- Homeless/Transitional Housing
- Resource and Referral
- Family Resource Center
- Skill Building/Ed for Children
- Adult Education (i.e. GED/Ed)
- Job Skills/Employment Prep
- Pre-Natal Class
- Family Literacy
- Marriage Strengthening/Prep
- Home Visiting
- Other (If you are using a specific curriculum, please name it here) _____

6.) **Participant's Attendance:** (Estimate if necessary)

A) **Answer at Pretest:** Number of hours of service offered to the consumer: _____

B) **Answer at Post-test:** Number of hours of service received by the consumer: _____

Paraphrasing Instructions for the Participant Form

Occasionally participants need further clarification in order to answer the questions. It is important that staff provide the same explanations to participants so that the survey administration is consistent. The paraphrasing provided below is intended for use by staff during the survey process. If a question arises, staff should rely on the paraphrasing to assist participants.

Demographic Information, Questions 1 - 10

Agency ID #

[The Agency ID # will be provided by the program staff]

Participant ID#

[The Participant ID # will be provided by the program staff]

1) Date survey completed

Write today's date. Please use the four-digit year (for example, 2007 instead of 07).

2) Sex

Are you a male or a female?

3) Age (in years)

Write your current age.

4) Race/Ethnicity

Select the race/ethnicity that best describes you. If the categories do not describe your race/ethnicity, select "other" and provide a description.

5) Marital Status

Select the box that best describes your current marital status.

6) Family Housing

Select the box the best describes what type of home your family current lives in. "Temporary" means that you have places to stay, but that you do not have an on-going residency in a household.

7) Family Income

The family income refers to the combined annual income of all family members in the household and could include earned income, child support, and Social Security payments among other sources.

8) Highest Level of Education

Select the box that best describes the highest level of education that you completed.

9) Which of the following do you currently receive?

Select all categories of assistance that you or anyone in your household currently receives.

10) Children in Your Household

List all of the children that are a part of your household. For each child, identify the child's gender, date of birth, and *your* relationship to that child. If you have more than four children, continue the list on the back of the sheet.

Agency ID _____

Participant ID # _____

1. Date Survey Completed: / / 2. Sex: Male Female 3. Age (in years): _____**4. Race/Ethnicity. (Please choose the ONE that best describes what you consider yourself to be)**

- A Native American or Alaskan Native B Asian
- C African American D African Nationals/Caribbean Islanders
- E Hispanic or Latino F Middle Eastern
- G Native Hawaiian/Pacific Islanders H White (Non Hispanic/European American)
- I. Multi-racial J Other _____

5. Marital Status:

- A Married B Partnered C Single D Divorced E Widowed F Separated

6. Family Housing:

- A Own B Rent C Shared housing with relatives/friends
- D Temporary (shelter, temporary with friends/relatives) E Homeless

7. Family Income:

- A \$0-\$10,000 B \$10,001-\$20,000 C \$20,001-\$30,000
- D \$30,001-\$40,000 E \$40,001-\$50,000 F more than \$50,001

8. Highest Level of Education:

- A Elementary or junior high school B Some high school C High school diploma or GED
- D Trade/Vocational Training E Some college F 2-year college degree (Associate's)
- G 4-year college degree (Bachelor's) H Master's degree I PhD or other advanced degree

9. Which, if any, of the following do you currently receive? (Check all that apply)

- A Food Stamps B Medicaid (State Health Insurance) C Earned Income Tax Credit
- D TANF E Head Start/Early Head Start Services F None of the above

10. Please tell us about the children living in your household.

Child 1: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
 ship to child D Sibling E Other relative F Foster-parent G Other
 DOB / /

Child 2: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
 ship to child D Sibling E Other relative F Foster-parent G Other
 DOB / /

Child 3: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
 ship to child D Sibling E Other relative F Foster-parent G Other
 DOB / /

Child 4: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
 ship to child D Sibling E Other relative F Foster-parent G Other
 DOB / /

If more than 4 children, please use space provided on the back of this sheet.

Paraphrasing Instructions for the Participant Form

Protective Factors Survey, Questions 1-11

- 1) **In my family, we talk about problems.**
When your family has a problem, how often does your family sit down and talk about it?
- 2) **When we argue, my family listens to “both sides of the story.”**
When there are disagreements in your family, how much of the time does each person get to share their side in an argument?
- 3) **In my family, we take time to listen to each other.**
How much of the time does your family listen to each other?
- 4) **My family pulls together when things are stressful.**
When your family is facing a hard time, how much of the time do you work together?
- 5) **My family is able to solve our problems.**
When your family has a problem, how much of the time are you able to come up with solutions?
- 6) **I have others who will listen when I need to talk about my problems.**
Do you have family, friends, neighbors or professionals who you can tell your problems to?
- 7) **When I am lonely, there are several people I can talk to.**
Do you have family, friends, neighbors, or professionals who you can talk to when you are lonely?
- 8) **I would have no idea where to turn if my family needed food or housing.**
When you need food or housing, you don't know about any available resources.
- 9) **I wouldn't know where to go for help if I had trouble making ends meet.**
You don't know where to get assistance when you need help paying your bills.
- 10) **If there is a crisis, I have others I can talk to.**
If you are faced with an emergency or an urgent situation, you have others you can talk to.
- 11) **If I needed help finding a job, I wouldn't know where to go for help.**
I don't where to get help when I need work.

Part I. Please **circle** the number that describes how often the statements are true for you or your family. The numbers represent a scale from 1 to 7 where each of the numbers represents a different amount of time. The number 4 means that the statement is true about half the time.

	Never	Very Rarely	Rarely	About Half the Time	Frequently	Very Frequently	Always
1. In my family, we talk about problems.	1	2	3	4	5	6	7
2. When we argue, my family listens to "both sides of the story."	1	2	3	4	5	6	7
3. In my family, we take time to listen to each other.	1	2	3	4	5	6	7
4. My family pulls together when things are stressful.	1	2	3	4	5	6	7
5. My family is able to solve our problems.	1	2	3	4	5	6	7

Part II. Please **circle** the number that best describes how much you agree or disagree with the statement.

	Strongly Disagree	Mostly Disagree	Slightly Disagree	Neutral	Slightly Agree	Mostly Agree	Strongly Agree
6. I have others who will listen when I need to talk about my problems.	1	2	3	4	5	6	7
7. When I am lonely, there are several people I can talk to.	1	2	3	4	5	6	7
8. I would have no idea where to turn if my family needed food or housing.	1	2	3	4	5	6	7
9. I wouldn't know where to go for help if I had trouble making ends meet.	1	2	3	4	5	6	7
10. If there is a crisis, I have others I can talk to.	1	2	3	4	5	6	7
11. If I needed help finding a job, I wouldn't know where to go for help.	1	2	3	4	5	6	7

Paraphrasing Instructions for the Participant Form

Protective Factors Survey, Questions 12-20

NOTE: Questions 12-20 ask participants to focus on the child that they hope will benefit most from your participation in our services. You can help participants identify the target child by asking, “What child do you think will benefit most from you being here?” or “Which child were you referred for services?” Remind them that they need to provide the child’s age first before they answer the questions.

Child’s Age or DOB

What is the age and date of birth of the child you hope will benefit most from your involvement in our services?

12) There are many times when I don’t know what to do as a parent.

I am often unsure what to do to be a good parent to my child..

13) I know how to help my child learn.

Do you know what your child needs to learn?

14) My child misbehaves just to upset me.

Do you think that your child acts up just to upset you?

15) I praise my child when he/she behaves well.

Do you praise your child for good behavior? If your child behaves well, do you tell him/her how happy you are?

16) When I discipline my child, I lose control.

Do you have a hard time controlling your temper when you discipline your child?

17) I am happy being with my child.

How much of the time do you enjoy being with your child?

18) My child and I are very close to each other.

How much of the time do you feel that your relationship with your child is strong?

19) I am able to soothe my child when he/she is upset.

How much of the time are you able to calm your child down when he or she is upset?

20) I spend time with my child doing what he/she likes to do.

How often do you do activities with your child that he or she enjoys?

Part III. This part of the survey asks about parenting and your relationship with your child. For this section, please focus on the child that you hope will benefit most from your participation in our services. Please write the child's age or date of birth and then answer questions with this child in mind.

Child's Age _____ **or** **DOB** ____/____/____

	Strongly Disagree	Mostly Disagree	Slightly Disagree	Neutral	Slightly Agree	Mostly Agree	Strongly Agree
12. There are many times when I don't know what to do as a parent.	1	2	3	4	5	6	7
13. I know how to help my child learn.	1	2	3	4	5	6	7
14. My child misbehaves just to upset me.	1	2	3	4	5	6	7

Part IV. Please tell us how often each of the following happens in your family.

	Never	Very Rarely	Rarely	About Half the Time	Frequently	Very Frequently	Always
15. I praise my child when he/she behaves well.	1	2	3	4	5	6	7
16. When I discipline my child, I lose control.	1	2	3	4	5	6	7
17. I am happy being with my child.	1	2	3	4	5	6	7
18. My child and I are very close to each other.	1	2	3	4	5	6	7
19. I am able to soothe my child when he/she is upset.	1	2	3	4	5	6	7
20. I spend time with my child doing what he/she likes to do.	1	2	3	4	5	6	7

Section IV
Sample Informed Consent Form

Sample Informed Consent Statement

(Name of Program) is conducting an evaluation to make sure that the families we serve are benefiting from our program. It is also a way for us to see what we are doing well and if there are areas in which we can improve. We want to provide the best possible services to our families and this is one way to keep us on track.

Part of the evaluation involves asking program participants to complete a survey about how our services affect them and their families. If you choose to participate in this evaluation, your identity will be kept confidential. No identifying information will be shared with anyone outside of this program.

Other information about the evaluation

Your participation is voluntary. Your services will not be affected by your participation or lack of participation.

Your privacy will be protected. Your name will not appear on the survey. If you are given a case ID, only authorized program personnel will know it and it will not be shared with anyone. Once you have completed the survey, the information on it will be transferred to a database and the survey will be destroyed.

We hope you will help us by participating in this evaluation. Your participation will help us to improve services to all families who may need it.

- I agree to participate in the evaluation by responding to the PFS survey.
- I choose not to participate at this time.

 Participant's Signature

 Date

 Program Staff Signature

 Date

Section V

Subscale Scores

Computing Subscale Scores
Technical Data

Computing Subscale Scores

The following are directions for calculating the scores by hand.

Step #1: Reverse score selected items

Before subscales can be calculated, all items need to be scored in the same direction such that a higher score reflects a higher level of protective factors. The following items require reverse-scoring: 8, 9, 11, 12, 14, 16.

To reverse-score the items listed above, use the following scoring transformation: A score of 1 is rescored 7, a score of 2 is rescored 6, a score of 3 is rescored 5, a score of 5 is rescored 3, a score of 6 is rescored 2, a score of 7 is rescored 1.

Step #2: Calculate the subscale scores

Family Functioning/Resiliency

The FFPSC subscale is composed of items 1 through 5. If fewer than 4 of items 1 through 5 were completed don't compute a score. If 4 or more items were completed sum the items responses and divide by the number of items completed.

Social Support

The SS subscale is composed of items 6, 7, and 10. If fewer than 2 of these items were completed don't compute a score. If 2 or more items were completed sum the items responses and divide by the number of items completed.

Concrete Support

The CS subscale is composed of items 8, 9, and 11. If fewer than 2 of these items were completed don't compute a score. If 2 or more items were completed sum the items responses and divide by the number of items completed.

Nurturing and Attachment

The NA subscale is composed of items 17, 18, 19, and 20. If fewer than 3 of these items were completed don't compute a score. If 3 or more items were completed sum the items responses and divide by the number of items completed.

Child Development/Knowledge of Parenting

The knowledge of parenting and child development factor is composed of five unique items (12, 13, 14, 15, 16). Because of the nature of these items, calculation of a subscale score is not recommended. Means, standard deviations, and percentages should be used to assess an agency's progress in this area.

Technical Data

The reliability of each subscale of the PFS has been estimated using an internal-consistency measure of reliability, Cronbach's coefficient alpha. Reliabilities for each subscale are provided below. For further information about the psychometric properties of the PFS, please refer to the technical report, available upon request from the University of Kansas Institute for Educational Research and Public Service.

Subscale	Reliability
Family Functioning/Resiliency	.89
Social Support	.89
Concrete Support	.76
Nurturing and Attachment	.81

Appendix C

The Protective Factors Survey

PROTECTIVE FACTORS SURVEY

(Program Information-- For Staff Use Only)

Agency ID _____

Participant ID # _____

Is this a Pretest? Post test?

1. Date survey completed: ____/____/____

2. How was the survey completed?

- Completed in face to face interview
- Completed by participant with program staff available to explain items as needed
- Completed by participant without program staff present

3. Has the participant had any involvement with Child Protective Services?

- NO YES NOT SURE

4. (A) Date participant began program (complete for pretest) _____/_____/_____

4. (B) Date participant completed program (complete at post test) _____/_____/_____

5. **Type of Services:** Identify the type of program that most accurately describes the services the participant is receiving. Check all that apply.

- Parent Education
- Parent Support Group
- Parent/Child Interaction
- Advocacy (self, community)
- Fatherhood Program
- Planned and/or Crisis Respite
- Homeless/Transitional Housing
- Resource and Referral
- Family Resource Center
- Skill Building/Ed for Children
- Adult Education (i.e. GED/Ed)
- Job Skills/Employment Prep
- Pre-Natal Class
- Family Literacy
- Marriage Strengthening/Prep
- Home Visiting
- Other (If you are using a specific curriculum, please name it here) _____

6.) **Participant's Attendance:** (Estimate if necessary)

A) **Answer at Pretest:** Number of hours of service offered to the consumer: _____

B) **Answer at Post-test:** Number of hours of service received by the consumer: _____



PROTECTIVE FACTORS SURVEY

197

Page 1

Agency ID _____

Participant ID # _____

1. Date Survey Completed: / / 2. Sex: Male Female 3. Age (in years): _____

4. Race/Ethnicity. (Please choose the ONE that best describes what you consider yourself to be)

- | | |
|--|---|
| <input type="checkbox"/> A Native American or Alaskan Native | <input type="checkbox"/> B Asian |
| <input type="checkbox"/> C African American | <input type="checkbox"/> D African Nationals/Caribbean Islanders |
| <input type="checkbox"/> E Hispanic or Latino | <input type="checkbox"/> F Middle Eastern |
| <input type="checkbox"/> G Native Hawaiian/Pacific Islanders | <input type="checkbox"/> H White (Non Hispanic/European American) |
| <input type="checkbox"/> I Multi-racial | <input type="checkbox"/> J Other _____ |

5. Marital Status:

- A Married B Partnered C Single D Divorced E Widowed F Separated

6. Family Housing:

- A Own B Rent C Shared housing with relatives/friends
 D Temporary (shelter, temporary with friends/relatives) E Homeless

7. Family Income:

- A \$0-\$10,000 B \$10,001-\$20,000 C \$20,001-\$30,000
 D \$30,001-\$40,000 E \$40,001-\$50,000 F more than \$50,001

8. Highest Level of Education:

- A Elementary or junior high school B Some high school C High school diploma or GED
 D Trade/Vocational Training E Some college F 2-year college degree (Associate's)
 G 4-year college degree (Bachelor's) H Master's degree I PhD or other advanced degree

9. Which, if any, of the following do you currently receive? (Check all that apply)

- A Food Stamps B Medicaid (State Health Insurance) C Earned Income Tax Credit
 D TANF E Head Start/Early Head Start Services F None of the above

10. Please tell us about the children living in your household.

Child 1: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
DOB / / ship to child D Sibling E Other relative F Foster-parent G other

Child 2: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
DOB / / ship to child D Sibling E Other relative F Foster-parent G other

Child 3: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
DOB / / ship to child D Sibling E Other relative F Foster-parent G other

Child 4: Male Female Your relation- A Birth parent B Adoptive parent C Grand/Great Grandparent
DOB / / ship to child D Sibling E Other relative F Foster-parent G other

If more than 4 children, please use space provided on the back of this sheet.

This survey was developed by the FRIENDS National Resource Center for Community-Based Child Abuse Prevention in partnership with the University of Kansas Institute for Educational Research & Public Service through funding provided by the US Department of Health and Human Services.



Part I. Please **circle** the number that describes how often the statements are true for you or your family. The numbers represent a scale from 1 to 7 where each of the numbers represents a different amount of time. The number 4 means that the statement is true about half the time.

	Never	Very Rarely	Rarely	About Half the Time	Frequently	Very Frequently	Always
1. In my family, we talk about problems.	1	2	3	4	5	6	7
2. When we argue, my family listens to "both sides of the story."	1	2	3	4	5	6	7
3. In my family, we take time to listen to each other.	1	2	3	4	5	6	7
4. My family pulls together when things are stressful.	1	2	3	4	5	6	7
5. My family is able to solve our problems.	1	2	3	4	5	6	7

Part II. Please **circle** the number that best describes how much you agree or disagree with the statement.

	Strongly Disagree	Mostly Disagree	Slightly Disagree	Neutral	Slightly Agree	Mostly Agree	Strongly Agree
6. I have others who will listen when I need to talk about my problems.	1	2	3	4	5	6	7
7. When I am lonely, there are several people I can talk to.	1	2	3	4	5	6	7
8. I would have no idea where to turn if my family needed food or housing.	1	2	3	4	5	6	7
9. I wouldn't know where to go for help if I had trouble making ends meet.	1	2	3	4	5	6	7
10. If there is a crisis, I have others I can talk to.	1	2	3	4	5	6	7
11. If I needed help finding a job, I wouldn't know where to go for help.	1	2	3	4	5	6	7



Part III. This part of the survey asks about parenting and your relationship with your child. For this section, please focus on the child that you hope will benefit most from your participation in our services. Please write the child's age or date of birth and then answer questions with this child in mind.

Child's Age _____ **or** **DOB** ____/____/____

	Strongly Disagree	Mostly Disagree	Slightly Disagree	Neutral	Slightly Agree	Mostly Agree	Strongly Agree
12. There are many times when I don't know what to do as a parent.	1	2	3	4	5	6	7
13. I know how to help my child learn.	1	2	3	4	5	6	7
14. My child misbehaves just to upset me.	1	2	3	4	5	6	7

Part IV. Please tell us how often each of the following happens in your family.

	Never	Very Rarely	Rarely	About Half the Time	Frequently	Very Frequently	Always
15. I praise my child when he/she behaves well.	1	2	3	4	5	6	7
16. When I discipline my child, I lose control.	1	2	3	4	5	6	7
17. I am happy being with my child.	1	2	3	4	5	6	7
18. My child and I are very close to each other.	1	2	3	4	5	6	7
19. I am able to soothe my child when he/she is upset.	1	2	3	4	5	6	7
20. I spend time with my child doing what he/she likes to do.	1	2	3	4	5	6	7

This survey was developed by the FRIENDS National Resource Center for Community-Based Child Abuse Prevention in partnership with the University of Kansas Institute for Educational Research & Public Service through funding provided by the US Department of Health and Human Services.



Appendix D*MPlus Syntax*

TITLE: PFS measurement factorial invariance

DATA: FILE IS jackieformplus.csv;

VARIABLE: NAMES ARE T1_FF1 T1_FF2 T1_FF3 T1_FF4 T1_FF5 T1_SS6 T1_SS7
T1_SS8 T1_CS9
T1_CS10 T1_CS11 T1_NA12 T1_NA13 T1_NA14 T1_NA15 T2_FF16 T2_FF17 T2_FF18
T2_FF19 T2_FF20 T2_SS21 T2_SS22 T2_SS23 T2_CS24 T2_CS25 T2_CS26 T2_NA27
T2_NA28 T2_NA29 T2_NA30;

MISSING ARE All (-999);

!Uses robust ML estimation to deal with skew and kurtosis
ANALYSIS: ESTIMATOR IS MLR;

MODEL:

!Factor loadings for time 1

FFT1 BY T1_FF1*(1);

FFT1 BY T1_FF2(2);

FFT1 BY T1_FF3(3);

FFT1 BY T1_FF4 (4);

FFT1 BY T1_FF5 (5);

SST1 BY T1_SS6* (6);

SST1 BY T1_SS7 (7);

SST1 BY T1_SS8 (8);

CST1 BY T1_CS9* (9);

CST1 BY T1_CS10 (10);

CST1 BY T1_CS11 (11);

NAT1 BY T1_NA12* (12);

NAT1 BY T1_NA13 (13);

NAT1 BY T1_NA14 (14);

NAT1 BY T1_NA15 (15);

!Factor loadings for time 2

FFT2 BY T2_FF16*(1);

FFT2 BY T2_FF17 (2);

FFT2 BY T2_FF18 (3);

FFT2 BY T2_FF19 (4);

FFT2 BY T2_FF20 (5);

SST2 BY T2_SS21* (6);

SST2 BY T2_SS22 (7);

SST2 BY T2_SS23 (8);

CST2 BY T2_CS24* (9);

CST2 BY T2_CS25 (10);
 CST2 BY T2_CS26 (11);
 NAT2 BY T2_NA27* (12);
 NAT2 BY T2_NA28 (13);
 NAT2 BY T2_NA29 (14);
 NAT2 BY T2_NA30 (15);

!Residual correlations between timepoints

T1_FF1 WITH T2_FF16; T1_FF2 WITH T2_FF17;
 T1_FF3 WITH T2_FF18; T1_FF4 WITH T2_FF19;
 T1_FF5 WITH T2_FF20; T1_SS6 WITH T2_SS21;
 T1_SS7 WITH T2_SS22; T1_SS8 WITH T2_SS23;
 T1_CS9 WITH T2_CS24; T1_CS10 WITH T2_CS25;
 T1_CS11 WITH T2_CS26; T1_NA12 WITH T2_NA27;
 T1_NA13 WITH T2_NA28; T1_NA14 WITH T2_NA29;
 T1_NA15 WITH T2_NA30;

!Set latent variance to 1 for identification

FFT1@1; SST1@1; CST1@1; NAT1@1;
 FFT2@1; SST2@1; CST2@1; NAT2@1;

!Within time correlations (equated)

FFT1 WITH SST1 (a); FFT1 WITH CST1 (b); FFT1 WITH NAT1 (c);
 SST1 WITH CST1 (d); SST1 WITH NAT1 (e); CST1 WITH NAT1 (f);

FFT2 WITH SST2 (a); FFT2 WITH CST2 (b); FFT2 WITH NAT2 (c);
 SST2 WITH CST2 (d); SST2 WITH NAT2 (e); CST2 WITH NAT2 (f);

!Structural Pathways

FFT2 ON FFT1 SST1 CST1 NAT1;
 SST2 ON FFT1 SST1 CST1 NAT1;
 CST2 ON FFT1 SST1 CST1 NAT1;
 NAT2 ON FFT1 SST1 CST1 NAT1;

OUTPUT:

TECH1 TECH4; STDYX;