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EXAMINING CHILD SEXUAL ABUSE AND FUTURE PARENTING: AN
APPLICATION OF LATENT CLASS MODELING

by

Kimberly W. D'zatko

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

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2011

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ABSTRACT

Examining Child Sexual Abuse and Future Parenting: An Application of
Latent Class Modeling

by

Kimberly W. D'zatko, Master of Science

Utah State University, 2011

Major Professor: Mark S. Innocenti, Ph.D.
Department: Psychology

This study was designed to empirically derive latent classes of mothers who were sexually abused during childhood and to assess the association between depression, alcohol/drug use, supportive intimate partner, and specific classes.

One hundred six women between the ages of 20 and 44 years ($M = 27$) who reported having been sexually abused during childhood (CSA) and 158 non-CSA mothers between the ages of 20 and 43 years ($M = 23$) were interviewed and assessed along six parenting dimensions. Logistic regression models evaluated the association between psychoemotional variables and specific classes.

The final model consisted of three classes—53.2%, 31.7%, and 15.2%. Alcohol/drug use was not statistically significantly associated with either class. Maternal depression and intimate partner support were differentially associated with the three parenting classes.

Empirical support is provided for distinct classes of mothers sexually abused in childhood. The data-driven categorization of CSA mothers provides research and clinical directions for future parenting of survivors of childhood sexual abuse.

(104 pages)

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Kimberly W. D'zatko

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CHAPTER I
PROBLEM STATEMENT

Introduction

Child sexual abuse (CSA) is a form of child abuse in which an adult or older adolescent uses a child for sexual stimulation (American Psychological Association [APA] Board of Professional Affairs, 1999). Modes of child sexual abuse include asking or pressuring a child to engage in sexual activities (regardless of the outcome), indecent exposure of the genitals to a child, displaying pornography to a child, actual sexual contact against a child, physical contact with the child's genitals (except in certain non-sexual contexts such as a medical exam), viewing of the child's genitalia without physical contact (except in nonsexual contexts such as a medical exam), or using a child to produce child pornography. CSA is a serious and widespread phenomenon. While CSA is perpetrated against young boys as well as young girls, the abuse context, the way in which the abuse is processed, and the effects of abuse have been shown to be gender-specific (Watkins & Bentovim, 1992). The current study focused on female survivors of CSA and future parenting outcomes. Research spanning more than three decades has produced a robust body of findings establishing the magnitude of CSA perpetrated against young girls. Similarly, the literature is replete with findings that over the long term, CSA negatively affects a woman's health and well-being (cf., Beitchman et al., 1992; Jumper, 1995; King, Mandansky, King, Fletcher, & Brewer, 2001; Putnam, 2003; Putnam & Trickett, 1997). Female survivors of CSA have been shown to be at high risk for impaired mental health as adults, as well as for difficulties in forming and maintaining

healthy adult relationships (cf., Beitchman et al., 1992; Polusny & Follette, 1995; Putnam, 2003; Putnam & Trickett, 1997). It is surprising, therefore, that relatively few researchers have investigated the impact of CSA on later parenting adjustment among female CSA survivors. Psychological characteristics are related to parenting behaviors (Downey & Coyne, 1990; Oates & Forrest, 1985; Simons, Lorenz, Wu, & Conger, 1993; Vondra, Sysko, & Belsky, 2005; van Bakel & Riksen-Walraven, 2002). Given the relation between CSA and survivor psychological maladjustment and the relation between individual psychological functioning and the development of parenting characteristics and behaviors, logically, we would expect CSA to affect future parenting by CSA survivors. Relative to what is known about the intrapersonal and interpersonal long-term effects of CSA, little is known about the long-term effects of CSA on parenting among female survivors. Even less is known about possible moderating factors and the potential protective role they play in the parenting functioning of adult CSA survivors. The long-term effects of CSA need to be investigated with particular focus on identifying elements that may operate as protective factors with respect to maternal functioning.

Thirteen studies have investigated the impact of CSA on survivor parenting outcomes. While findings are mixed, the majority of these studies suggest at least some link between CSA and later parenting characteristics. Limitations within the CSA parenting literature affect our ability to draw conclusions and plan interventions. If these studies measured the same parenting domains using similar instruments, and if findings were consistent across the majority of studies, conclusions could be drawn with confidence. However, across the 13 studies, nine different domains of parenting quality

were investigated. Measurement inconsistencies across studies further exacerbate the limitations: 14 different instruments, with varying psychometric properties were used to measure the nine parenting domains. Such diversity in methods and instruments makes it difficult to form consistent conclusions about the relation between CSA and future parenting.

Inconsistencies in the definition and operationalization of parenting domains and CSA variables, as well as individual study limitations due to inadequate control of other correlated variables, inappropriate statistical procedures, and/or inadequate sample sizes further impede efforts to draw meaningful conclusions from the literature. In sum, while existing literature hints at an association between CSA and later parenting outcomes, the overall picture is unclear. A better understanding of the relation between CSA and parenting adjustment is needed to inform clinicians in their assessment and treatment of CSA survivors who are or will be parents.

Advancement in this area holds the promise of improving the parenting experiences of survivors and their parent-child relationships, which have been shown to affect children's developmental outcomes. For instance, in a study of 129 parent-infant dyads, van Bakel and Riksen-Walraven (2002) found that the quality of maternal interactive behavior was significantly related to infants' attachment security and cognitive development. Maternal psychosocial problems have been found to be predictive of children's behavior problems (Erickson, Sroufe, & Egeland, 1985) and preschoolers' hostile behavior in the classroom (Lyons-Ruth, Alpern, & Repocholi, 1993). Parenting quality has also been shown to predict children's competence motivation (Meij, Riksen-

Walraven, & van Lieshout, 2000).

Evidence linking CSA to long-term adverse effects indicates a great deal of heterogeneity across victims and outcomes. Yet, studies that have examined the link between CSA and future parenting outcomes have, so far, been predicated on the assumption of homogeneity within the population of female survivors with respect to parenting outcomes associated with CSA. In order to better understand the mechanisms of risk and resilience in future parenting by CSA survivors, research is needed that takes a person-centered approach predicated on the assumption of heterogeneity among victims.

Extant Data

Extant data made available by the National Archive on Child Abuse and Neglect, Cornell University, Ithaca, NY, provides an excellent opportunity in this study to examine, from a person-centered perspective, the parenting of CSA women. Data from the *Parenting Among Women Sexually Abused in Childhood*, 1998 follow-up study were originally collected by Mary I. Benedict, Dr.PH., M.S.W. The Office on Child Abuse and Neglect, Children's Bureau, U. S. Department of Health and Human Services provided the funding for that study (contract #90-CA-1544) and will be used for secondary analysis in the current study.

Thirty-eight percent of the 265 women in the Benedict (1998) study reported at least one incident of sexual abuse before the age of 18. For inclusion in the CSA sample, the perpetrator could be either a relative or non-relative of the victim and had to be at

least 5 years older than the victim, except in cases where the women reported the use of force. While archived data did not identify which cases involved contact, the original study reported that penetration (37%) and force (45%) were common. All data for the current analyses were collected through telephone (19%) or in-person (81%) interviews when the mother's first child was between 2 and 4 years of age. In the original study, women whose only experience was after the age of 17 were put in the comparison group, and were not included in the current study. Data from the reference group of 158 non-CSA mothers included in the original and follow-up studies were analyzed for profile comparisons.

In the current study, secondary analyses were conducted on the archived data from the original study to test the hypothesis that with respect to parenting, there are two distinct subgroups among CSA mothers: those who are functioning well and those who are not. The parenting variables available for the current study include: Parenting competence, parenting satisfaction, and parenting efficacy, parenting distress, discipline practices, parental sense of mastery; and family functioning. While not exhaustive of the variables in the broader parenting literature, this array of parenting variables captures those parenting characteristics which are important in the sexual abuse outcome literature, the context within which the current study is placed. All of the parenting variables will be entered into a latent class model as indicators of an underlying latent parenting structure among CSA survivors. Several potential correlates were also measured: depression, intimate partner support, interpersonal violence and drug and alcohol use. These variables were entered into classification models as covariates.

CHAPTER II

REVIW OF THE LITERATURE

This review begins with a summary of ‘best estimates’ regarding the prevalence of CSA, and the challenges to deriving such estimates. A summary of conclusions from three published reviews on long-term CSA impacts follows with a brief discussion of findings from studies that were not included in the reviews. These reviews provide convincing evidence of psychological impairment among a significant portion of adult female CSA survivors. Finally, an integrated review of current CSA parenting studies is presented. This meta-analytic review examined the strength of association between CSA and parenting outcomes, as well as the extent to which measures of the effects of CSA on parenting covary with subject and study characteristics. Subject and study characteristics examined in this analysis are the populations from which study samples were drawn, age-of-abuse cutoff for a subject to have been included as a CSA victim, marital status, whether potential intervening variables such as SES or depression were controlled for or included as moderators in statistical models, study publication year, sample size, and a validity rating of study conclusions.

Prevalence

The National Resource Council on Child Sexual Abuse (1994) estimated that between 20% and 60% of the US population has experienced some type of CSA. The US Department of Health and Human Services, Administration for Children and Families, Child Welfare Information Gateway (2000) reported that girls are sexually abused at a

rate of four times that of boys. Several studies conducted over the past 20 years estimated that one in three women are reported to have been sexually abused as children (Duncan, 2004). The largest retrospective study on the prevalence of CSA found that 24% of women in the US report having been sexually abused at some time during their childhood (Dube et al., 2005). These estimates indicate that in the US, as many as 24 million women between the ages of 15 and 55 were child victims of sexual abuse.

Several factors drive the imprecision of CSA prevalence estimates. Foremost, significant numbers of cases go unreported because many child victims do not disclose the abuse (Hanson, Resnick, Saunders, Kilpatrick, & Best, 1999). While issues surrounding nondisclosure are complex, they can be described along three general themes: distrust, fear, and guilt (Bagley, 1992; Berlinger & Barbieri, 1984; Courtois & Watts, 1982). CSA involves the betrayal of a child by an adult. It is commonly held that this betrayal leads to the victim's general inability to trust, which in turn, inhibits disclosure of the abuse (Gagnon & Hersen, 2000; Sheldon & Bannister, 1998). Victimized children may fail to disclose their assault because of the fear of perceived consequences being worse than the sexual abuse (such as consequences to their family, consequences from one or more family members, consequences to the offender, and/or retaliation by the offender). Feelings of shame and guilt are pronounced among child victims of sexual abuse—sexual shame, guilt over vengeful feelings toward the perpetrator and/or another adult who failed to protect the victim, and guilt over being “disloyal” and bringing disruption to their family if they were to disclose the abuse (Gagnon & Hersen, 2000).

Low precision in prevalence estimates also stems from the lack of any uniform working definition of CSA (Browne & Lynch, 1995). There is wide disagreement on the fundamental elements of CSA, such as whether a noncontact activity (e.g., exhibitionism, exposure to pornography) constitutes abuse, the age for consent to sexual interaction, and what constitutes unacceptable age discrepancies between those engaged in the sexual activity. While some prevalence estimates come from studies using a “contact” definition of CSA, others define CSA as any adult conduct with a child for the sexual gratification of the adult, whether or not there is any form of contact. Higher estimates include sexualized exposure without contact, such as masturbating in front of the child. All too commonly, studies do not elaborate on either the CSA definition or age of maturity used in prevalence estimates.

Long-term Effects of CSA

Diversity among definitions adds to the overall complexity of understanding the effects of CSA, as well. Predictably, the long-term effects of CSA are as diverse and complex as the experience of CSA, itself. In the following sections I will summarize literature reviews and primary study findings pertaining to first, long-term *intrapersonal* outcomes, then *interpersonal* outcomes. Next, I will present a meta-analytic review of findings pertaining to CSA and future parenting.

Intrapersonal Outcomes Associated with CSA

Intrapersonal outcomes are those emotional and behavioral outcomes that exist or

occur within the individual, as opposed to outcomes that occur in relation to others. Intrapersonal outcomes related to CSA are many and frequently overlap with one another. In a published review of the long-term effects of CSA against females, Beitchman and colleagues (1992) concluded that women who reported a history of CSA were more likely to experience anxiety, depression, suicidal ideation and behavior (particularly in the case of force or violence), and sexual disturbance and dysfunction than women reporting no history of CSA. Sexual victimization beyond childhood was also more common among CSA survivors. While individual disorders were shown to occur at higher rates among CSA survivors, the authors concluded that the evidence did not support an association between CSA and a post-sexual abuse syndrome, which would require, by definition, a consistently appearing set of symptoms, nor was there evidence to support a relation between CSA and personality disorders. With respect to abuse-specific variables and long-term outcomes, the authors concluded that longer duration of abuse is associated with greater long-term harm as are penetration in the form of intercourse or oral-genital sex and father- or stepfather-as-abuser.

A 2003 research update review by Putnam supports and adds to these earlier conclusions. Putnam concluded that a history of CSA is associated with sexualized behaviors including increased risk for earlier pregnancy and higher rates of arrest for prostitution. This is consistent with evidence that female CSA survivors frequently demonstrate low levels of sexual esteem, which has been shown to predict inappropriate sexual behavior, promiscuity or prostitution (Wingood & DiClemente, 1997). The reviewer also concluded that lifetime prevalence of major depression in female CSA

survivors is three to five times that of women with no CSA history and that among women who do experience depression, CSA survivors experience earlier onset of depressive episodes, as well as prolonged durations of depression. Consistent with Beitchman and colleagues (1992), Putnam also concluded that contact sexual abuse is generally associated with poorer long-term outcomes, as is a close relationship with the abuser. However, the relationship to the abuser is confounded with age of abuse onset, duration and frequency of abuse, and use of force. Given the complexity of confounds, few studies in either of these reviews were able to achieve the controls required to make concrete inferences regarding the independent effects of abuse-specific variables.

In the 2003 review, Putnam noted that because of the diversity of associated outcomes, CSA has been regarded by some as a nonspecific risk factor, which is consistent with Beitchman's earlier findings of little support for a post-CSA syndrome. Putnam concluded that there was sufficient evidence to infer a causal relation between CSA and psychopathology, and that the greatest effects are observed in depression, drug and alcohol dependence, bulimia nervosa, rape after age 18, and social anxiety.

In addition to the narrative reviews above, a 1995 meta-analysis (Jumper, 1995) quantitatively examined the findings of 23 investigations into the long-term effects of CSA on depression, self-esteem, and a catch-all variable, "psychological symptomology," which included other intrapersonal maladjustment issues such as anxiety-related problems, personality disorders and suicidal behavior. Study and sample characteristics included in the analyses were sample source (community, clinical, student, and other), abuse definition (contact, noncontact, consensual), year of publication, and

gender. A measure of study quality was not included as a covariate in the meta-analysis.

The author concluded that the evidence supported an association between CSA and each of the three outcomes overall, though effect sizes varied across sample sources and abuse definitions ($r_u = .09 - .40$). The aggregate effect size for depression was $r_u = .22$, for self-esteem, $r_u = .17$, and for psychological symptomology the aggregate effect sizes was $r_u = .27$. Effect sizes were generally larger among clinical populations and victims of contact abuse ($r_u = .29 - .36$). Studies published prior to 1987 reported statistically significantly larger effect sizes ($r_u = .23$) than more recent studies ($r_u = .07$) examining depression and self-esteem.

Given the diversity of long-term intrapersonal outcomes associated with CSA, the decision to collapse several outcomes into one is understandable. However, the melting-pot nature of the “psychological symptomology” outcome in this review limits any meaningful conclusions about the specific disorders comprising such an outcome. Meta-analyses that isolate important outcomes beyond depression and self-esteem, such as revictimization, substance abuse, and intimate partner relationships would enhance the CSA literature and promote a better understanding of the heterogeneity in levels of psychological functioning among abuse survivors.

Interpersonal Outcomes Associated with CSA

In their review of the literature on the interpersonal effects of CSA, Davis and Petretic-Jackson (2000) concluded that overall, a significant proportion of CSA survivors experience difficulty in sustaining stable interpersonal relationships. The authors’

conclusions that an inability to trust, a sense of powerlessness, and perceived stigmatization stemming from sexual abuse during childhood, operate as barriers to developing and maintaining healthy adult relationships is well-founded. Sanderson (2006) described the long-term interpersonal effects as clustering around attachment issues, and observed that survivors often vacillate between seeking and fearing attachment. Research over the past two decades corroborates the conclusion that CSA survivors commonly develop an impaired ability to form and maintain intimate and trusting relationships with either men or women (Courtois, 1988; Finkelhor, 1984; Herman, 1992; Russell, 1986). Studies also show that CSA victims are more likely in adulthood to be involved in physically abusive relationships than nonvictims (National Resource Center, 1994).

Impact of Childhood Sexual Abuse on Future Parenting Outcomes:

An Integrated Review

Meta-analysis presents distinct advantages over conventional narrative reviews, especially when there seems to be disparity among multiple studies, as is the case in the CSA-parenting literature. Because meta-analyses rely on a strong quantitative method aimed toward an orderly summation of results from multiple studies, they provide us with comprehensive knowledge from separate findings. This meta-analysis provides a synthesis of existing findings regarding CSA and future parenting. Additionally, this meta-analysis will shed light on why individual study findings differ, by plotting outcomes against study design and sample characteristics. The primary aims of this meta-

analytic review are to integrate the CSA parenting literature to (a) test the hypothesis that CSA correlates positively to parenting maladjustment among adult female survivors, (b) identify specific parenting domains that demonstrate the greatest relative CSA impact, and (c) explore the degree to which study outcomes covary with such subject and study characteristics as the populations from which study samples were drawn, sample sizes, ethnicity proportions within samples, victims' maximum age of abuse for study inclusion, different parenting outcomes, outcome measurement instruments, publication year, marital status of study subjects, whether controls were achieved for SES, child physical abuse concomitant with CSA, depression, supportive intimate partner relationship, and study quality.

Method

Sample

Two strategies were used to locate primary studies of parenting outcomes among female CSA survivors. Initially, studies were located through systematic searches of *Academic Search Premier*, *Dissertation Abstracts*, *Educational Resources Information Center (ERIC)*, *PsycINFO*, *MEDLINE*, *Psychology and Behavioral Sciences Collection*, and *Social Sciences Abstracts* electronic databases. Combinations of the keywords *child (hood) sex (ual) abuse*, *parenting*, *mother(s)*, *long-term effects*, and *adult sequelae* were used to compile a list of potential studies. Study abstracts were then examined to isolate appropriate studies. Books, book chapters, and full text articles were retrieved and their respective tables of contents and reference lists examined to locate additional studies for

the meta-analytic review.

Searches produced a sample of three unpublished studies and eleven published studies. It should be noted that while two unpublished studies were not included in the final analyses because they contained insufficient information for calculation of effect size estimates, one unpublished study was included in the final analysis, reducing the likelihood of bias toward published studies. Table 1 presents the studies by author along with year of publication/submission, parenting domain investigated, validity rating, sample size, and Cohen's *d* estimate of effect. Studies included in the meta-analysis met the following criteria: (a) The study was designed as an investigation into the parenting attitudes, practices, experiences, and/or efficacy of adult females who had met primary study criteria for inclusion as a child victim of sexual abuse; (b) The study included one or more quantified dependent measures of parenting characteristics; and (c) Information reported was sufficient to calculate effect size estimates.

It should be noted that while the majority of studies included a comparison group of adult females not classified as having been a victim of CSA, this was not a criterion for inclusion in the meta-analysis, nor was use of a norm-referenced outcome measure. However, given CSA prevalence estimates noted above, it is not unlikely that norming samples of adult females would include CSA survivors, which would diminish the observed impact of CSA on a norm-referenced measure. A final sample of eleven studies was used in the meta-analysis. Eight of these studies reported findings sufficient to calculate multiple effect size estimates (i.e., multiple measures of parenting characteristics) for a total of 26 effect sizes.

Table 1

CSA Parenting Studies (N = 11) and Effect Size Estimates (N = 26)

Year	Author	Parenting domains	Validity rating	N	Effect size (<i>d</i>)	Standardized effect size z_r'
1991	Burkett	Dysfunctional parenting attitudes	High (3)	40	0.79	0.39
		Parentification/Role reversal	High (3)	40	2.2	0.95
		Parentification/Role reversal	High (3)	40	1.35	0.63
1992	Cole, Woolger, Power, & Smith	Permissive/under control	Med. (2)	45	1.01	0.48
		Parenting efficacy	Med. (2)	45	0.58	0.29
1996	Zuravin & DiBlasio	Punitive/Abusive behaviors	Med. (2)	97	0.0	0.00
		Neglect	Med. (2)	102	0.0	0.00
1997	Banyard	Punitive/abusive behaviors	High (3)	430	.28	0.14
		Parenting efficacy	High (3)	430	.20	0.10
		Hypervigilant parenting style	High (3)	430	.00	0.00
1999	Zuravin & Fontanella	Punitive/Abusive behaviors	Low (1)	474	.65	0.32
		Parenting efficacy	Low (1)	513	.14	0.07
2001	Buist & Janson	Parenting efficacy (skill)	Med. (2)	45	.23	0.11
2001	Ruscio	Dysfunctional parenting attitudes	Med. (2)	35	.28	0.14
		Dysfunctional parenting attitudes	Med. (2)	35	.20	0.10
		Permissive/under control	Med. (2)	45	.18	0.09
		Permissive/under control	Med. (2)	752	1.19	0.56
		Authoritarian	Med. (2)	752	.93	0.45
2005	Scheutze & Eiden	Punitive/Abusive behaviors	Low (1)	263	.08	.04
		Dysfunctional parenting attitudes	Low (1)	263	.06	0.03
2005	Cooper	Parentification/role reversal	Med. (2)	91	.22	0.11
		Dysfunctional parenting attitudes	Low (1)	91	.11	0.05
		Hypervigilant parenting style	Med. (2)	91	.56	0.28
		Abuse risk	Low (1)	91	.02	0.01
2005	Wright, Fopma-Loy, & Fischer	Parenting efficacy	High (3)	79	1.06	0.25
2006	Mapp	Abuse risk	Low (1)	263	.08	0.04

As a measure of study quality, I assigned individual findings within each study an overall index score ranging from 1-3, with higher numbers reflecting higher quality, based on the degree to which plausible threats to the internal validity of study conclusions were present. See Appendix A for rating protocol.

Variables Coded

Coding decisions used for this meta-analytic review were informed by the broader

parenting literature and included sample demographic characteristics, as well as delineation of sample sources (e.g., clinical, college, or child welfare services), and specific parenting constructs along with the instruments used to measure these constructs. Intra- and interpersonal outcomes, such as depression and intimate relationships, controlled in primary model statistical models were also coded in this meta-analysis. As noted, several studies reported multiple findings from distinct samples or subsamples. Therefore, the following variables were coded for each individual finding.

- publication year
- proportion of African-American study subjects
- sample size
- mean age of study subjects
- mean age of study subjects' children
- maximum age of abuse for inclusion as a victim of CSA
- sample source (community, clinical, university, Aid to Families with Dependent Children, Child Protective Services)
- parenting construct
- instrument used to measure parenting construct
- whether SES, depression, supportive intimate partner, or physical abuse concomitant with child sexual abuse were controlled or included as mediator/moderator variables
- marital status of sample subjects
- effect size estimates for parenting outcomes
- racial makeup of sample
- study quality rating Study characteristics are summarized in Table 2; instrument-by-parenting construct are summarized in Table 3.

Table 2

CSA Study Characteristics (N = 11)

Characteristic	Number of studies (<i>k</i>)	%	Mean effect size (<i>d</i>)	<i>SD</i>
Population				
Clinical	4	36.4	.83	.60
Community	3	27.2	.21	.27
University	1	.09	.19	.22
Aid to dependent families	1	.09	.29	.31
Child Protective Services	2	18.2	.10	.12
CSA age criteria ^a				
14	4	36.4	.56	.68
18	5	45.5	.29	.39
Study sample ethnicity				
≥ 50% Black	5	62.5		
< 50% Black	3	37.5		
Ethnicity not reported	3	37.5		
Sample status				
Single mothers only	3	27.2	.65	.79
Mixed marital relationship status w/children	7	63.6	.42	.40
Mixed relationship status: no children	1	.09	.19	.22
Controlled variables				
SES	4	36.4	.36	.58
vs. did not control for SES	7	63.6	.47	.57
Childhood physical abuse	2	18.2	.44	.57
vs. did not control for childhood physical abuse	9	81.8	.43	.55
Moderator/mediator variables				
Depression	3	27.2	.21	.27
vs. no depression mediating variable	8	72.7	.47	.55
Supportive partnership	5	45.4	.50	.44
vs. no supportive partnership mediator/moderator	6	54.5	.42	.55
SES	1	.09	.28	.29
vs. no SES mediator/moderator	10	90.9	.44	.53
Sample size	11	mean sample size = 206		

Note. (*d*) = Cohen's *d*;

^aage criteria not reported in two studies

Table 3

CSA Parenting Domains Measured (N = 9) and Instruments Used (N = 14)

Parenting characteristic	Number of studies	Instruments used	Instrument mean effect size ^b (<i>d</i>)	Construct mean <i>ES</i>
Parentification or role reversal	4	Parent Behavior/Attitude Questionnaire	.22	1.26
		Child rearing practices	2.2	
		SASB ^a	1.4	
Punitive/abusive behaviors	4	Conflict tactics scale	.23	.13
		Child Protective Services report	.00	
		Multiple items from one or more subscales	.08	
Dysfunctional parenting attitudes	5	Parent Behavior/Attitude Questionnaire	.09	.14
		Parenting Attitudes Questionnaire	.24	
		Instrumentation unreported	.06	
Permissive/undercontrol parenting style	3	Parent Practices Questionnaire	.68	.79
		Parenting Dimensions Inventory	1.01	
Authoritarian parenting style	1	Parent Practices Questionnaire	.93	.93
Parenting efficacy	5	Parenting Dimensions Inventory	.58	.31
		Parenting Stress Inventory	.61	
		Parenting Competence Scale	.15	
		Parenting Self-Efficacy Scale	.23	
		Single item	.14	
Neglect	1	Child Protective Services	.00	.00
Hyper-vigilant parenting style	3	Child Rearing Practices Scale	.79	.45
		Safety Questionnaire	.56	
		Single Item	.00	
Abuse risk	2	Parenting Stress Inventory	.08	.05
		Safety Questionnaire	.02	

^aSASB: Structural Analysis of Social Behavior model (25, 12).

^bSeveral studies reported multiple effect sizes for a single parenting outcome—means are calculated across the total number of effect sizes reported for a construct measured with a given instrument. *d*: Cohen's *d*

Computation and Analysis of Effect Size Estimates

Standardized effect size measures are generally used when outcome metrics are not intrinsically meaningful (e.g., score on a parenting practices questionnaire on an arbitrary scale) and when findings from multiple studies using diverse scales are being combined, as is the case in this meta-analysis. Because of its growing popularity, Cohen's

d measure of effect has becoming something of a standard in the social sciences literature. Therefore, Cohen's d was calculated for each of the primary study findings for descriptive purposes. The effect size estimate used in the meta-analysis was r_u , the correlation between CSA and parenting outcomes (Rosenthal & Rosnow, 1986; Rosnow & Rosenthal, 1996; Rosnow, Rosenthal, & Rubin, 2000). Reported correlations were used from each study's findings or, where not reported, were calculated from reported test statistics using the formula,

$$r_u = \sqrt{\left[\frac{F(1, _)}{F(1, _)} \right] + df_{error}}$$

where an F statistic was reported (e.g., a one way analysis of variance [ANOVA] with two groups),

$$r_u = \sqrt{\left[\frac{t^2}{(t^2 + df _)} \right]}$$

where a t statistic was reported, or

$$r_u = \frac{d}{\sqrt{(d^2 + 4)}}$$

from Cohen's d measure of effect.

Given that r cannot take on values greater than $|1.0|$, the sampling distribution of r becomes progressively negatively skewed as the magnitude of ρ (population correlation) increases (i.e., the distribution cannot extend as far in the positive direction as it can in the negative direction). Therefore, because Pearson's r is not normally distributed, r_u estimates were then transformed to the normally-distributed variable z' using the formula,

$$z' = .5 \ln \left[\frac{1+r}{1-r} \right]$$

where \ln is the natural logarithm.

The studies in this meta-analysis varied in size from $n = 40$ to $n = 752$. Since an effect size based on substantially larger samples is assumed to be a more precise estimate of the population from which it is drawn (i.e., will produce smaller confidence intervals), it follows that the larger studies should carry more weight in the meta-analysis than the smaller studies. The effect sizes used in this analysis were weighted by their inverse variance using the standard error of each effect size, which is a direct index of the effect size itself. Using Hedges and Olkin's (1985) formula for optimal weights for meta-analysis, weights were computed as:

$$w = \frac{1}{se^2}$$

where the standard error for z' (the zr transformed correlation coefficient), is computed as:

$$se = \sqrt{\frac{1}{n-3}}$$

For each of the 26 effect size estimates used in the analysis, Fisher's z was also used for computing 95% confidence intervals on Pearson's r .

Finally, a homogeneity test was conducted to assess whether the variance in study effect sizes was greater than would be expected by chance and sampling error or, in other words, to test the null hypothesis of a common population effect size where the population is comprised of CSA -parenting studies. The test statistic used in the test of

homogeneity is Q , calculated as (Hedges & Olkin, 1985):

$$Q = \sum (w \times z'^2) - \frac{[\sum (w \times z')]^2}{\sum w}$$

and follows a chi-square distribution with $k-1$ degrees of freedom where k is the number of effect sizes. A nonsignificant Q value indicates homogeneity among study effect sizes, where a significant Q value indicates observed differences in study effect sizes are greater than would be expected to occur by chance. In the case of a significant Q value, study characteristics (e.g., study quality, sample source, sample size, outcome measured, year study published) are generally examined as possible explanations for the observed variance.

Results

Table 2 summarizes the study characteristics coded for the meta-analysis. The analysis included a total of 5,348 study subjects across all studies. Most subjects were sampled from clinical (36.4%), community (27.2%), and from Child Protective Services settings (18.2%). The majority of studies did not control for SES (63.6%) or type of childhood physical abuse (81.8%). Depression was included as a mediator/moderator variable in a minority of studies (27.2%); supportive intimate partnership was included as a mediator/moderator in nearly half of the studies (45.4%).

Six of the 11 studies examined multiple parenting outcomes, the most prevalent of which were dysfunctional parenting attitudes (45.5%), parenting efficacy (45.5%), parentification or role reversal (36.4%), and punitive and abusive behaviors (36.4%)

(Table 3). In all, 17 measures of parenting outcomes were used.

Statistical Hypothesis Testing of the Unbiased Effect Size Estimate

The unbiased effect size estimate ($r^u = .192$) shown in the first row (whole sample) of Table 4 supports the hypothesized positive relation between CSA and future parenting outcomes as measured across the sample of 26 effect size estimates. As indicated by the 95% confidence interval (.18 - .23) this effect size estimate is statistically significantly different from 0. However, the homogeneity test produced a statistically

Table 4

Parenting Constructs Effect Size Estimates and Categorical Model Test

Source	<i>k</i>	<i>m</i>	<i>n</i>	z_+	z_T	s_{zT}	r_u	95% C.I. r_u	Q_T	Q_w
Whole sample	26		5,348	.208			.19	.18 - .23	106.23**	
Parentification or role reversal		4	261		.462	0.06	.47	.42 - .52		3.56**
Punitive/abusive behaviors		4	1,269		.123	0.03	.12	.10 - .15		9.10*
Dysfunctional parenting attitudes		5	475		.070	0.05	.07	-.01 - .12		8.96
Permissive/Undercontrol parenting style		3	842		.351	0.03	.36	.30- .41		25.05*
Authoritarian parenting style		1	752		.420	0.04	.42	.40 - .44		-
Parenting efficacy		5	1,542		.142	0.03	.14	-.01 - .21		6.71
Neglect		1	102		0	-----	0	----		-
Hyper-vigilant parenting style		4	85		.188	0.11	.19	-.06 - .29		0.03
Abuse risk		1	20		.010	0.24	.01	-.23 - .25		-

*Significant at $\alpha = .05$.

** significant at $\alpha = .01$

significant Q_T value, indicating heterogeneity among effect sizes greater than would be expected by chance and/or sampling error.

Graphical inspection of the data (Figures 1, 2, and 3), inspection of outliers and bivariate correlations, and analysis of covariance (ANCOVA) results (Table 5) identified parenting construct and year of publication as the leading candidates to which variability in effect size estimates would likely be attributed. However, one effect size from a 1991 study (Burkett; $n = 40$) was identified as an outlier, as this effect size ($d = 2.20$) falls beyond 1.5 times the interquartile range from the third quartile (Figure 4). It is implausible that CSA was any more related to future parenting outcomes in 1991 than in later years; a more plausible explanation for Burkett's findings of a greater magnitude is that measures used in that study provided greater precision. The Burkett study was the only study found in the literature search that utilized videotaped family interaction tasks as well as interviews, whereas the other studies relied primarily on self-report measures. In the Burkett study, the videotaped family interactions were analyzed with Benjamin's

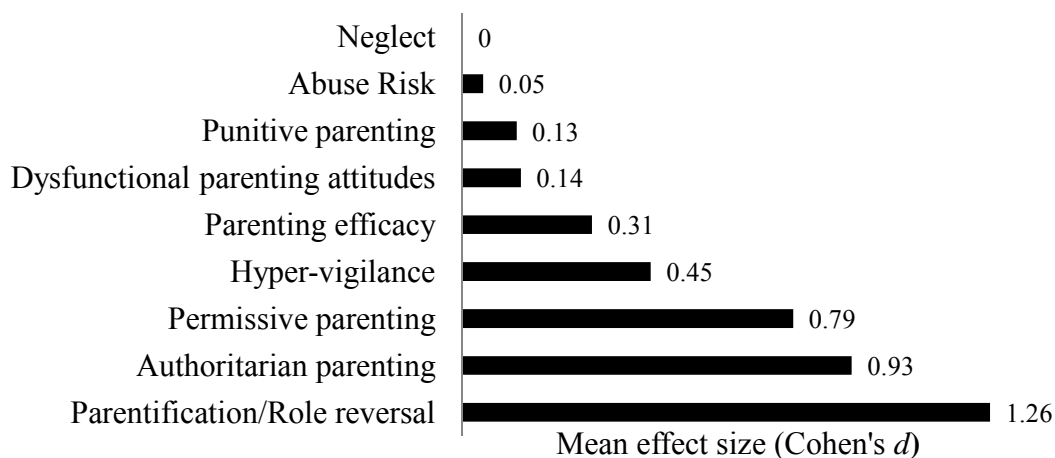


Figure 1. Plot of mean effect size estimates by parenting construct.

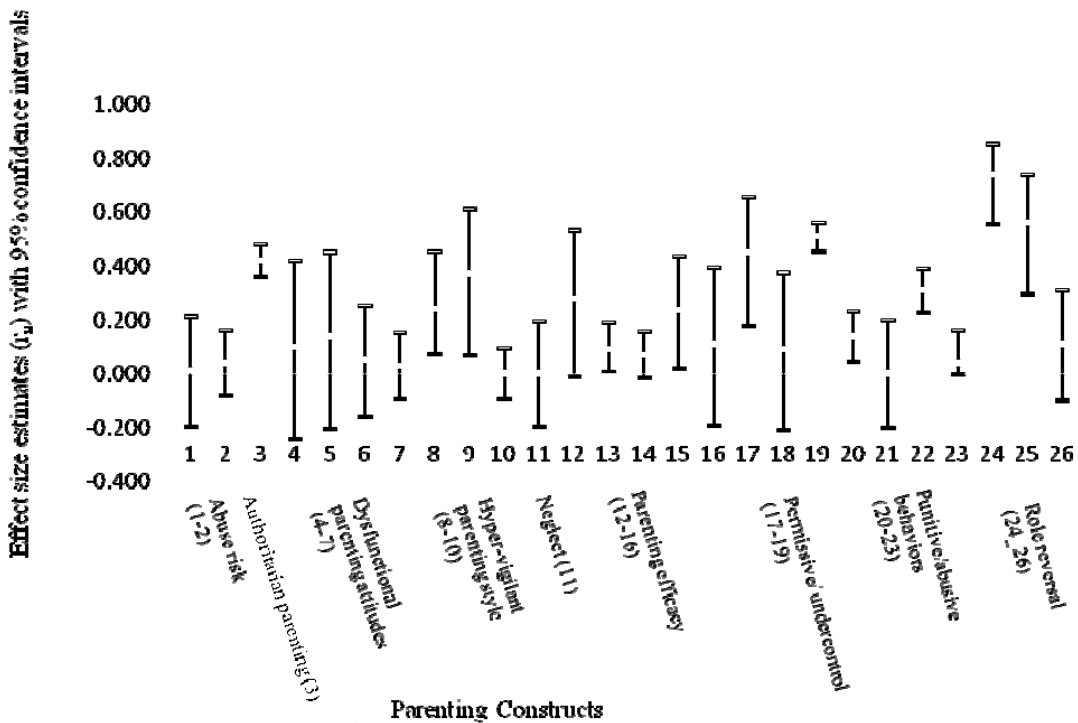


Figure 2. Plot of standardized effect size estimates (r_u) with 95% confidence intervals by parenting construct.

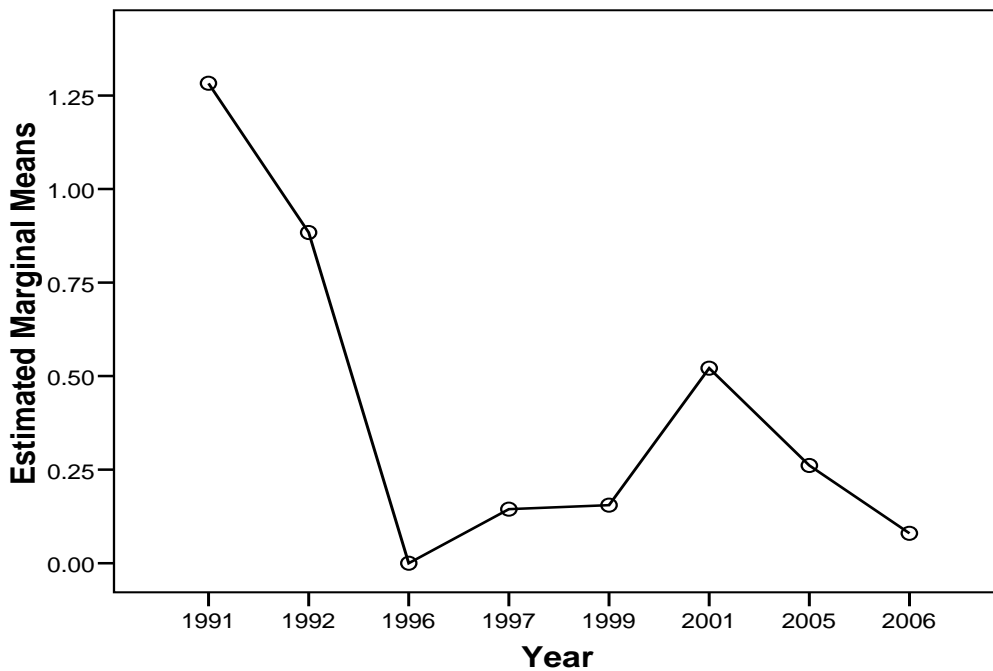


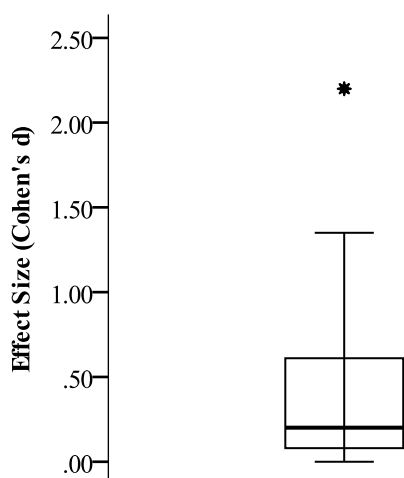
Figure 3. Plot of effect size (d) means by publication year.

Table 5

CSA Parenting Effect Size Analysis of Covariance

Effect	<i>F</i> value	<i>P</i> value	Partial eta squared
Corrected model	2.47	.04	.58
Year	5.40	.03	.23
Parent construct	2.30	.05	.54
Proportion of mothers in the sample who were Black	1.58	.24	

$R^2 = .676$ (Adjusted $R^2 = .495$)

Figure 4. Box plot of effect sizes ($n = 26$).

structural analysis of social behavior, and showed that women who had been sexually abused were more self-focused, rather than child-focused, compared to nonabused women. In the interviews, the women who had been sexually abused during childhood gave strong evidence of greater reliance on their children for emotional support. It was not reported in the study, however, whether interviewers and video coders were blind to

the purpose of the study or to the status of the mothers in the sample. In the absence of blinding, there is an increased likelihood of rater bias, which may also account for findings of a greater magnitude. When this case was removed from the sample of studies, the unbiased effect size estimate remained statistically significant at $r^u = .187$, supporting the null hypothesis. However, publication year was no longer considered to be a source of variance among study effect sizes, and was not investigated further. Parenting construct was not significantly influenced by this outlying case and was, therefore, included in the categorical model.

Results of the categorical model are shown in Table 4. These results reveal significant between-class (parenting construct) effects (Q_b), as well as significant within class (Q_w) effects, indicating that while parenting construct does, in fact, account for a significant portion of the variance in effect size estimates, there is significant variance across effect size estimates *within* parenting construct classes that remains unexplained. While instrumentation may account for a portion of the remaining variance, it was not possible to enter instrument as an additional class into the categorical model because some instruments were used to measure multiple parenting constructs across studies.

Conclusion

The parenting domain with which CSA demonstrates the greatest relation is parentification or role reversal, where children experience higher levels of responsibility than is normative, and whose needs are not attended to reliably and consistently (Jurkovic, Kuperminc, Sarac & Weisshaar, 2005). For instance, Cole and Woolger (1989) found that women with a history of incest and who held negative perceptions of their own mothers

were more likely to endorse parenting attitudes such as “most children are toilet trained by 15 months” and “the earlier a child is weaned from its emotional ties to its parents, the better it will handle its own problems.” The authors interpreted their findings as possibly indicating that women who were survivors of childhood incest may have a greater tendency to distance themselves from normative parenting roles while their children are young. Large effects were reported across multiple, and in some cases, contradictory parenting domains (authoritarian parenting, permissive parenting, hyper-vigilance, and low parenting efficacy), however, which leads to the logical conclusion that CSA survivors are not a homogenous population with respect to future parenting outcomes. While, clearly, causation cannot be discerned within the data accumulated regarding CSA and later parenting characteristics, in light of an aggregated effect of $r = .19$ across 26 effect size estimates and eleven studies, it appears that sexual victimization as a child and future parenting issues are not independent phenomena.

A Person-Centered Approach

In contrast to the above studies, the current study focuses on an emerging person-centered framework in the examination of CSA in relation to how it can manifest in various ways in terms of parenting. The previous CSA-parenting research was conducted using a variable-centered approach, based on an assumption of homogeneity among CSA victims with respect to how CSA operates on future parenting. Measures of central tendency (e.g., means and medians), correlations, regression coefficients, and structural models were used to inform us about relations among variables of interest. These

findings, while often couched in language about individuals (e.g., women who have experienced CSA are more likely to be over-protective parents), are in fact, findings about variables (e.g., CSA is related to parentification or role reversal).

However, treating CSA survivors as a homogenous group runs contrary to what is known about the high degree of variability regarding the effects of CSA on adult psychopathology. Not all CSA survivors experience long-term negative outcomes and among those who do, there is a great deal of variability with regard to the nature and magnitude of those outcomes. Given that CSA survivors constitute a mixed group with respect to their experiences of victimization, as well as their adult outcome sequelae, we would expect similar patterns of heterogeneity to emerge in parenting outcomes, consistent with the findings from the above meta-analysis. Therefore, a singular linear relation between CSA and later parenting does not adequately represent the variability in parenting outcomes.

A person-centered approach, on the other hand, is helpful in examining meaningful subgroups among samples. A person-centered approach is key to our empirical understanding of mothers who were sexually abused in childhood and in designing targeted interventions to improve parenting outcomes for CSA survivors who are struggling as mothers. In examining the parenting outcomes of CSA mothers one variable at a time, we run the risk of overlooking or de-emphasizing the risk dynamics among mothers who are experiencing parenting challenges. Statistical findings that best characterize an entire sample may counter findings of subgroups within a given sample. Therefore, the current study uses a person-centered statistical approach, Latent Class

Analysis, to characterize subgroups of mothers among a sample of women who were sexually victimized as children and examines a range of potential psycho-emotional predictors of parenting subgroup affiliation.

Primary Aims

The primary purposes of the study are to (a) use a person-centered approach to examine variation in parenting outcomes among CSA survivors, (b) examine whether parenting profiles found among CSA survivors lend support to previous findings of a relation between CSA and future parenting outcomes, and (c) see how well we can predict mothers' profile classification from three long term outcomes also associated with CSA: depression, drug/alcohol abuse risk, and intimate partner support.

The hypotheses for this study are shown below.

1. Distinct subgroups will be found among a sample of mothers who are CSA survivors.
2. A significant relation will be observed between parent profile classification and maternal depression, intimate partner support, and maternal substance abuse

CHAPTER III

METHOD

Sample

The women in this study were originally recruited from two prenatal clinics at a large university hospital in the northeast US. The demographic and parenting data were collected from August, 1995 to November, 1996 during a follow-up to an earlier study where CSA data were collected when the sample of primiparous women were pregnant. The follow-up interview took place when the children were between 18 months and 6 years of age. The CSA sample consisted of 106 women between the ages of 20 and 44 years ($M = 27$) who reported having been sexually abused during childhood. The majority of the women were African American (73%) and had completed high school (80.5%). Fifty-two percent of the sample indicated an income of less than \$20,000 per year. The majority were married or living with a partner (54%), 34% were currently in a dating relationship/had a partner but were not living together, and 12% were not currently in a dating relationship.

Each of these women reported experiencing at least one instance of sexual abuse before the age of 18. Thirty-eight percent of CSA incidents occurred when the victim was between 13 and 17 years of age, 54% occurred when the victim was between 7 and 12 years old, and 9.4% occurred before the child was 6 years old. Cases that consisted of consensual sexual practices were included in the original study if the perpetrator was reported to have been at least 5 years older than the victim. All cases, irrespective of age

differential, in which force or threat of force was reported, were included. Eight-one percent of the reported CSA incidents involved contact and 44% involved penetration. Forty-five percent of the reported incidents involved the use of force or threat of force and approximately 30% were intrafamilial.

While not the focus of this study, data from the reference group of 158 non-CSA mothers included in the original and follow up studies were analyzed for profile comparisons. The reference group consisted of women between the ages of 20 and 43 years ($M = 23$). The mothers' age distributions in both the CSA and the reference group are positively skewed, with the majority of the data gathered from 21-25 years old. The mean age in both groups was 23 years old. The majority of the women in the reference group were African American (70%) and had completed high school (84%). Eight-two percent of the reference group indicated an income of less than \$15,000 per year. The majority were not married or living with a partner (59%), 40% were currently in a dating relationship/had a partner but were not living together, and 23% were not currently in a dating relationship. Table 6 summarizes sample characteristics of the CSA sample and the reference sample.

Table 6

Characteristics of CSA and Non-CSA Reference Sample

Characteristic	CSA sample	Non-CSA reference sample
African American	73%	70%
Married or living with partner	54%	41%
Intimate partner, not living together	34%	40%

Given that the non-CSA women were recruited along with the CSA women it was hypothesized that no significant demographic differences would be observed between the two groups. The proportion of women who had attained a high school education or beyond did not differ by group, $\chi^2(3, N = 252) = 10.42, p = .23$ (Figure 5), nor did the proportion of women who were homeowners, $\chi^2(2, N = 258) = 4.17, p = .12$, nor the proportion of women who were living in public or subsidized housing, $\chi^2(2, N = 158) = 3.22, p = .35$ (Figure 6). Mean household yearly income did not differ by group, $\chi^2(6, N = 138) = 7.53, p = .27$ (Figure 7), nor did the women's ages, $t(262) = -1.12, p = .27$.

No substantial differences were observed in ethnicity or intimate partner status (see Table 6).

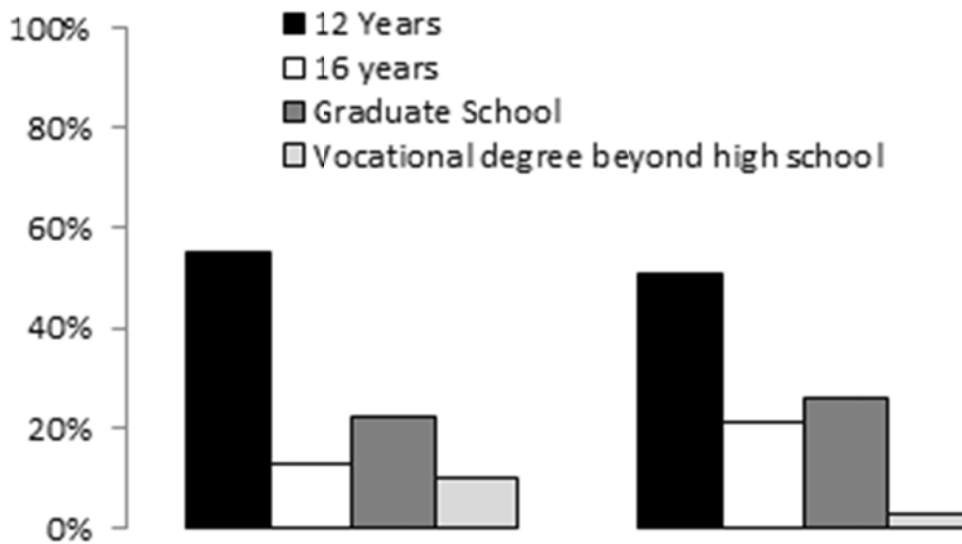


Figure 5. Level of education by CSA (case) and non-CSA (control) groups.

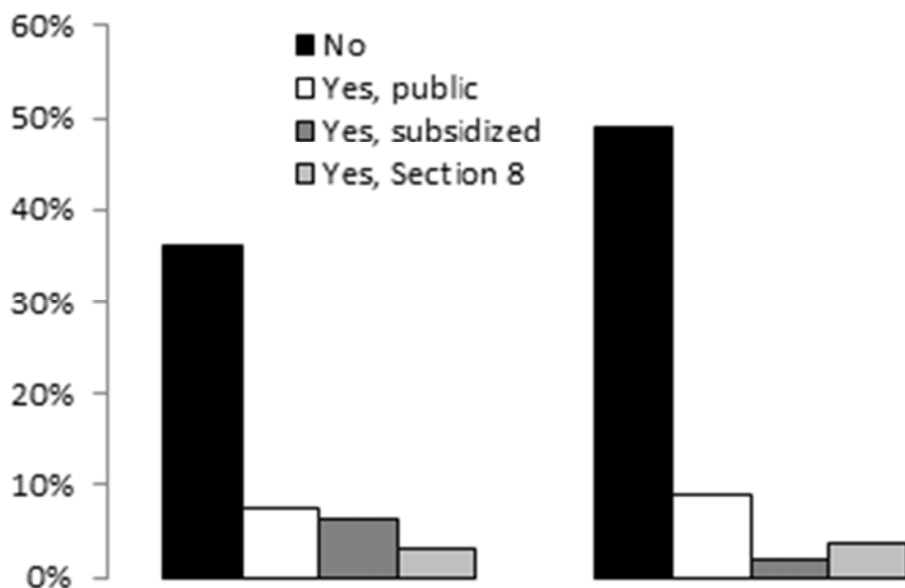


Figure 6. Public or subsidized housing by CSA (case) and non-CSA (control) groups.

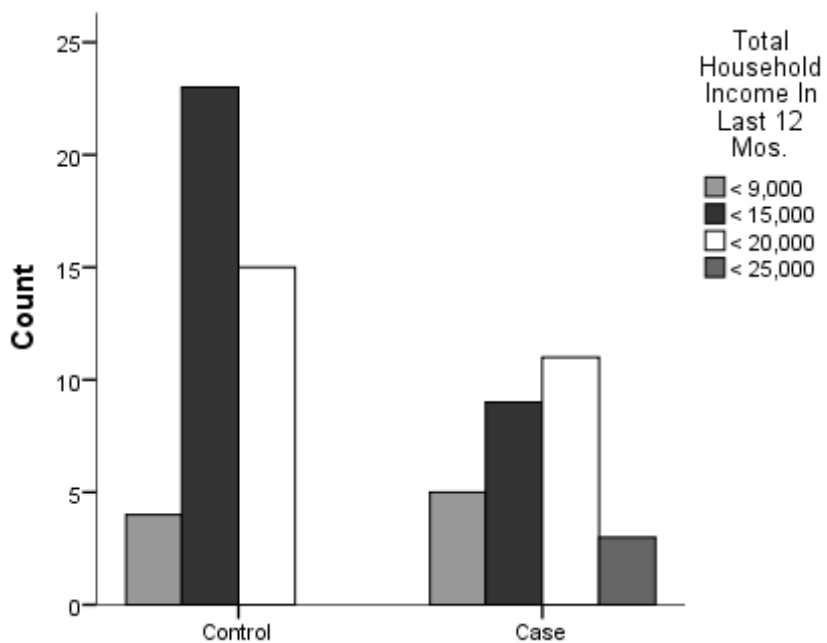


Figure 7. Total household yearly income by CSA (case) and non-CSA (control) groups.

Procedure

The database used in the study was obtained from the National Data Archive on Child Abuse and Neglect (NDACAN, data set #85, September 2005) through the Family Life Development Center, Cornell University. The majority of the interviews occurred face-to-face with a trained interviewer; however, 19.1% of the interviews were conducted via telephone because the mothers lived outside the study area. The interview took approximately 75-90 minutes to complete, and participants were compensated for their participation. Informed written consent was obtained from all recruited participants.

Measures

All of the measures used in this study are self-report. Of the six multiple-item measures, five assessed aspects of parenting and one examined psychological functioning.

Individual items assessed the degree of alcohol and drug use. Eight individual items assessed perceived partner support from current intimate partner. Perceived partner support items were administered only to women who reported having an intimate partner at the time of the interview. Table 7 summarizes the measures used in the study and each is described in detail below.

Attachment and Parenting Competence

The Parenting Stress Index (PSI; Abidin, 1979, 1982) assesses for dysfunction in the parent child relationship, based on a theory that the level of distress in the relationship

Table 7

Measures

Construct	Instrument	Internal consistency (alpha)	Number of items
Dysfunctional attachment	Attachment subscale of The Parenting Stress Index (PSI; Abidin, 1979, 1982)	.68	7
Undemanding indulgent	Summated rating scale constructed for the current study	.76	9
Dismissive parenting	Adapted from Adult-Adolescent Parenting Inventory (AAPI; Bavolek, 1984)	.80	6
Punitive parenting	Summated rating scale constructed for the current study	.74	8
Parenting efficacy	Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston & Wandersman, 1978)	.70	17
Mastery in the parental role	Mastery Scale (Pearlin, Menaghan, Lieberman, & Mullan, 1981)	.72	9
Parenting competence (reverse scored)	Competence subscale of The Parenting Stress Index (PSI; Abidin, 1979, 1982)	.77	11
Intimate partner support	Summated rating scale constructed for the current study	.91	8

is the result of child and parent characteristics. The PSI, therefore, has subscales that make up a child domain and a parent domain. The parent domain measures the level of dysfunction a parent feels in their parental role due to personal factors, such as a low sense of competence as a parent or because of perceived lifestyle restrictions stemming from parenting. The two subscales in the parent domain of the PSI entered individually into the latent class model as parenting indicators were competence and attachment. PSI items are presented in the form of statements and require a response on a 5-point scale from strongly disagree (1) to strongly agree (5). For each of the subscales, higher levels of parental stress are indicated by higher scores.

High scores on the attachment dysfunction subscale indicate two possible sources of dysfunction in the parent-child relationship: one, the mother does not feel a sense of emotional closeness to her child, and two, her real or perceived inability to understand her child's feelings and/or needs accurately (Abidin, 1979, 1982). The central theme of attachment theory is that mothers who are available and responsive to their infant's needs establish a sense of security. The dysfunctional attachment subscale of the PSI cannot be viewed as a proxy measure of a child's insecure attachment style or disorganized attachment style. However, this subscale has been shown to correlate significantly with preschoolers' Q-set security scores ($r = -.29, p = .024$; Teti, Nakagawa, Das, & Wirth, 1991), which purports to measure attachment security. Additionally, Teti and colleagues reported that both the PSI dysfunctional attachment subscale and the Attachment Q-Set security scores were significantly associated with the quality of mother-child interactions, as evaluated independently by raters who were fully blind to the Q-Set and PSI scores, reducing the likelihood that associations between the Q-Set and the PSI were reflective of mothers' parenting self-concept or social desirability. As the focus of this study is on parenting profiles, the PSI dysfunctional attachment subscale was used as a measure of mothers' perceived dysfunction in the mother-child relationship, and not as a measure of children's attachment style. As such, a low score on this subscale is not interpreted as indicative of children's secure attachment style.

While attachment styles in adulthood do not precisely mirror infant attachment styles, research suggests that early attachments can have a serious impact on later relationships, and that intervening experiences such as CSA, also play a large role in

adult attachment styles (Ainsworth, 1989; Bowlby, 1969). As CSA occurs in the context of relationships, it was hypothesized to be a significant parenting indicator, possibly segregating mothers who have been especially resilient to the effects of CSA, and those who have not. Bowlby (1982) proposed that mothers' systems for parenting their own children develop out of her own working model of attachment. Specifically, a mother's system for interacting with her child develops out of her childhood representations of "other."

The parenting competence subscale was reverse scored to ease interpretation, such that low scores on the competence subscale indicate parent distress due to a lack of practical child development knowledge, a limited range of child management skills, and/or the feeling that the role of parent is not as reinforcing as the parent expected (Abidin, 1979, 1982).

Perceived Efficacy

Coleman and Karraker (2003) found a significant relationship between parenting self-efficacy and observed toddler adjustment. High maternal parenting efficacy significantly predicted high child enthusiasm, compliance, affection, and low child avoidance and negativity. Mothers' perceived parenting efficacy was measured by the PSOC (Gibaud-Wallston & Wandersman, 1978). The PSOC assesses two parenting efficacy attributes: (a) skills/ knowledge, which reflect mothers' belief that they have the necessary skills and understanding to be a good parent; and (b) value/ comfort, which reflect the value a mother places on parenthood and her level of comfort in that role (Gibaud-Wallston & Wandersman, 1978). Each item is answered using a 6-point scale

that spans from strongly agree (1) to strongly disagree (6). Scoring for question numbers 1, 6, 7, 10, 11, 13, 15, and 17 is reversed to ensure that respondents are answering consistently. Items are summed and higher scores reflect the parent's perception of functioning well as a parent. Gibaud-Wallston and Wandersman reported internal consistency reliability of alpha coefficient equal to .80 for the total scale. The alpha coefficient was .70 for the mothers in the current study. Evidence for convergent and discriminate validity of the instrument has also been documented (Gibaud-Wallston, 1977).

Mastery

Mothers' feelings of mastery versus powerlessness in their parental role were measured by the mastery scale (Pearlin et al., 1981). The scale is comprised of nine items ranging from strongly disagree (1) to strongly agree (4). Lower scores indicate greater feelings of powerlessness and being ineffectual as a parent, where a higher score indicates feelings of mastery and being effectual in the role of parent. Items included statements such as "I can do little to save my child from harm" (reverse scored) and "I do a good job of caring for child." Reported test-retest reliability ranges from 0.70 to 0.85 (Kalil, Tolman, Rosen, & Gruber, 2003; Mercer, May, Ferketich, & DeJoseph, 1986). Internal consistency reliability with this sample of mothers was .72.

Parent Practices

Thirty-five items that the original investigators included in the interview were used to measure the participants' use of various verbal and physical discipline techniques

with their child. Each item was assessed on a 4-point rating scale to assess frequency of use ranging from (0) not at all to (3) very frequently. To reduce the number of observational variables for parent practices, a principal components analysis was conducted with Varimax rotation using the 35 items. This analysis yielded two composite subscales, consisting of eight and nine items, respectively. The internal consistency for the first composite scale was .74 (Cronbach's alpha). The sum of these eight items was used as the score for punitive parenting with a potential range from 0 (indicating no usage of punitive practices) to 24 (considerable reliance on punitive practices).

The internal consistency for the second composite scale was .76 (Cronbach's alpha). The sum of these nine items was used as the score for Undemanding Parenting, measuring a mother's tendency to make few developmentally appropriate behavioral demands of her child. This scale has a potential range of 0 to 27, where the higher the score, the less a mother makes behavioral demands on her child. Individual items, their factor loadings, and communalities are shown in Table 8.

Dismissive Parenting Attitudes

Six items from an initial pool of 14 from the AAPI (Bavolek, 1984) regarding the mothers' parenting attitudes, yielded a single dismissive attitudes factor in a principal components analysis. Individual items and their factor loadings are shown in Table 9. The items were presented in the form of statements requiring a response on a 5-point scale from strongly disagree (1) to strongly agree (5). Strong endorsement of items such as "children who feel secure often grow up expecting too much" and "parents who encourage their children to talk with them only end up listening to complaints" would be

Table 8

Varimax Rotated Factor Loadings for Items on the Punitive and Undemanding Parent Practices Subscales

Scale	Item	Factor loadings		Communalities
		Factor 1	Factor 2	
Punitive	When you were upset or under stress, how frequently did you pick on or nag at your child?	.44	.08	.20
	When your child misbehaved, how frequently did you get into a long argument with him/her?	.49	.14	.26
	When your child misbehaved, how frequently did you raise your voice and yell at him/her?	.67	.16	.47
	After there was a problem with your child, how frequently did you hold a grudge against the child?	.23	.00	.05
	When your child misbehaved, how frequently did you spank, slap, grab or hit him/her?	.69	-.14	.49
	When your child misbehaved, how frequently did you curse at or use bad language toward the child?	.76	.02	.59
	When your child did something you did not like, how frequently did you insult him/her, say mean things, or call him/her names?	.69	.01	.47
	When your child misbehaved, how frequently did you threaten to do things that you knew you wouldn't actually do?	.66	.23	.27
Undemanding	When you told your child not to do something, how frequently did you repeat it over and over again?	.33	.41	.49
	How frequently did you let your child do whatever he/she wanted?	.01	.66	.44
	When you wanted your child to stop doing something, how frequently did you coax or beg the child to stop?	.24	.53	.34
	When you went out someplace with your child, how frequently did you let him/her get away with a lot more than when you were at home?	-.09	.61	.38
	When your child did something you didn't like, how frequently did you ignore it or just let it go?	.05	.55	.30
	When your child didn't do what you asked, how frequently did you let it go or end up doing it yourself?	.19	.45	.24
	If saying "no" didn't work when your child was misbehaving, how frequently did you offer your child something nice so he/she would behave?	-.12	.59	.36
	When you said your child couldn't do something, how frequently did you let him/her do it anyway?	.33	.66	.54
If your child got upset when you said "no," how frequently did you back down and give in to your child?	.03	.78	.60	

Table 9

Dismissive Parenting Attitudes Item Factor Loadings

Parenting attitude	Factor loading
Children who feel secure often grow up expecting too much	.72
Parents who pay attention to their children's feelings and moods often spoil their children	.73
Children who are given too much love by their parents will grow up to be stubborn and spoiled	.68
Parents who encourage their children to talk with them only end up listening to complaints	.78
Children whose feelings and needs are ignored by their parents will often grow up to be more independent	.66
Parents will not spoil their children by picking them up and comforting them when they cry (reverse scored)	.71

indicative of more dismissive attitudes toward child rearing, than strong endorsement of items such as “parents will not spoil their children by picking them up and comforting them when they cry.” Items such as the latter, that indicated a less dismissive attitude, were reverse scored and the sum score of these six items was used as a parenting indicator in the latent model, where high scores on this scale indicate dismissive parenting attitudes. Internal consistency for this scale was .80 (Cronbach's alpha).

In addition to the parenting variables used in profiling the mothers in this CSA sample, five measures of mothers' well-being were explored as potential correlates of parenting profiles.

Depression

A substantial body of literature has shown depressed mothers to be less nurturing, more restrictive, more negative, disorganized, and inconsistent with their young children

(Field, Hernandez-Reif, & Diego, 2006; Gelfand & Teti, 1990; Goodman & Brumley, 1990) than nondepressed mothers. Pelaez, Field, Pickens, and Hart (2008) found that depressed mothers showed more authoritarian and disengaged behavior patterns. Field and colleagues found depressive mothers of infants to show withdrawn and intrusive interaction styles. Because of the association between CSA and future depressive symptoms, and the relation between depression and dysfunctional parenting behaviors, depression was included as a covariate and potential predictor of parenting class membership in the latent class model.

The CES-D is a 20-item scale used to measure depressive symptomology. Mothers in this study were asked to respond with the frequency of various feelings and behaviors experienced during the past week up to the day of the interview over a four-point scale. Responses range from *rarely or none of the time* (value = 1; less than one day) to *most or all of the time* (value = 4; 5-7 days over the last week). The CES-D has high internal consistency (.89 to .90), construct validity, and concurrent validity when compared to clinical diagnostic criteria. It has been used extensively and has been shown valid and reliable with different ethnic groups (Roberts, 1980; Roosa, Reinholtz, & Angelini, 1999).

Intimate Partner Support

The protective effects of having a supportive intimate partner on parenting attitudes and behaviors have been shown in mothers of both premature and full-term infants. In a study of 105 mothers, Crnic, Greenberg, Ragozin, Robinson, and Basham (1983) concluded that intimate partner support had positive effects on maternal attitudes

and interactive behavior with their children at one month and at four months. The authors further concluded that this support moderated the adverse effects of stress on several maternal behavioral variables. Intimate partner support was considered an important covariate in the current study as a potential moderator between CSA and future maladaptive parenting behaviors and attitudes.

Mothers in this CSA study were asked eight questions regarding the extent to which they felt supported by their intimate partner. Confirmatory factor analysis conducted with these eight items yielded the expected single-factor. The items from this partner support scale were summed, and higher scores indicated higher levels of perceived partner support. Individual items and their factor loadings are shown in Table 10. Internal reliability for this scale was .91 (Cronbach's alpha).

Table 10

Supportive Intimate Partner Factor Loadings

	Factor loadings
I can count on my partner for financial help	.741
I talk to my partner about important things	.765
My partner is affectionate towards me	.756
My partner cares for my children	.749
My partner understands my feelings	.760
My partner talks with me and spends time with me	.853
My partner is someone who I can count on	.885
My partner does things with me	.823

Interpersonal Violence

In situations of hostile, conflictual, adult interactions, negativity from the aggression often spills over into the parenting relationship. In their meta-analytic review of 39 studies from family relations literature pertaining to family conflict, Krishnakumar and Buehler (2000) reported that parenting behaviors, particularly harsh discipline and parental acceptance, are significantly impacted by interpersonal conflict.

The Conflict Tactics Scale violence subscale (CTS-V; Straus, 1979, Straus & Gelles, 1989) was used to measure current physical and verbal violence perpetrated against and by the mothers in the sample. The frequency of 12 possible conflict-resolution tactics were assessed and items were categorized as mild (e.g., “restraining physically”) to severe (e.g., “beating up” and “choking/asphyxiating”). Frequency was rated on an eight-point scale from “never” to “more than 20 times,” as well as an endorsement of “never in the past year, but (the event) did happen before.” The CTS-V has been empirically validated across several studies and is widely used to measure the frequency of violent acts perpetrated in response to family conflict. Coefficient alpha for internal consistency in the study sample was .68.

Drug and Alcohol Abuse Risk

The relation between maternal alcohol or drug problems and possible child maltreatment is evident. Children whose parents or care givers have alcohol or drug problems suffer from physical and emotional problems at a greater rate than children in the general population (Bijur, Kurzon, Overpeck, & Scheidt, 1992) and among confirmed cases of child maltreatment, 40% involve alcohol or other drugs (Children of Alcoholics

Foundation, 1996). Further, maternal alcohol or drug abuse have been associated with a home environment characterized by disruption, inadequate parenting, and insecure parent-child attachment (Black, 1982). Given higher rates of alcohol and drug abuse among CSA survivors, and the relation between substance abuse and risky parenting, drug and alcohol abuse risk variables were included in the LCA model as potential covariates with mothers' latent profiles.

Two dichotomous (yes/no) drug risk variables were created by collapsing the following individual drug-use items: (a) use of marijuana and/or hashish and (b) use of heroine, crack or rock, cocaine or powder, hallucinogens, methamphetamine, street or illegal methadone, and opiates. Alcohol abuse risk was measured by a single beer, wine, and liquor consumption frequency variable, scaled to drinks per day.

Analyses

Latent class analysis (LCA) is a statistical method commonly used for detecting subtypes of related cases from multivariate data. It is often referred to as Mixture distribution modeling because a single distribution may be comprised of a mixture of distributions, as depicted in Figure 8. Conceptually, LCA is analogous to cluster analysis. In the social sciences, investigators use LCA to classify individuals or groups of individuals according to some underlying properties, referred to as latent constructs. LCA hypothesizes that the relationships among observed variables, referred to as indicators, result from the existence of two or more unobservable (i.e., latent) classes of subjects and uses the underlying latent construct to describe those relationships. For example, in a

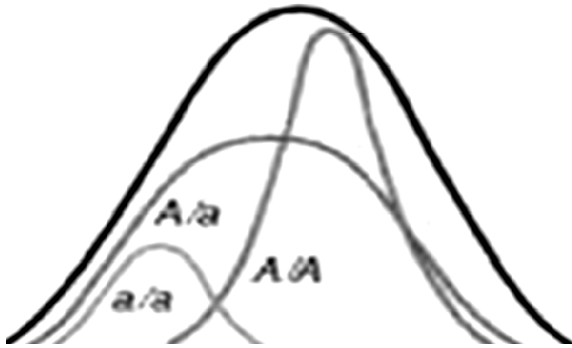


Figure 8. Mixture distribution.

study of over 2,000 Early Head Start (EHS) mothers, Cook, D'zatko, and Roggman (2009) used 13 parenting variables as indicators in an LCA model which empirically identified three distinct parenting classes: a “developmental” class where mothers were generally high on nurturing and high on cognitive stimulation; an “unsupportive” class where mothers had a high probability of being low on nurturing and high on detachment, intrusiveness, and negative regard; and a “dismissive” class where mothers had the highest probability of being very low on emotional climate and verbal-social support, yet a low probability of being intrusive/ controlling.

A common misconception regarding LCA sometimes arises in the comparison between LCA and factor analysis. LCA is not conceptually analogous to factor analysis. Where factor analysis is concerned with the structure of variables (e.g., items on a scale), LCA is concerned with the structure of cases. Methodologically, however, both analysis techniques are useful for data reduction; latent classes and factors are both unobservable constructs, and as the number of factors or classes increases, the better the “fit” of the model to the data. Clearly, a number of classes equal to the number of cases, while being

a perfect fit, would render any model uninterpretable and defeats the modeling purpose altogether.

LCA is used in this study as a means to capture the heterogeneity in parenting characteristics among mothers who were sexually victimized during childhood and not observed in mothers who are similar in SES, geographic location, and age, who did not experience CSA. Specifically, LCA is used here to test the hypothesis that there are distinct subtypes of parenting structures among female survivors of CSA that are not found among their non-CSA counterparts, and that these subtypes (also referred to as classes) are characterized by latent qualities identified in previous literature and discussed in the meta-analysis, as being associated with CSA.

Lazarsfeld (1954, 1955) introduced and demonstrated the uses of latent structure models to categorize individuals into classes based on a series of measured (i.e., manifest or observed) dichotomous survey items (indicators). Recent advances in statistical algorithms (e.g., expectation maximization [EM] for maximum likelihood estimation) used in estimating latent models and the development of statistical software capable of handling computationally heavy algorithms, have made it possible to estimate latent models with any type of indicator, be it nominal, count, binary, ordinal, and in the case of this study, continuous. LCA with continuous outcomes is sometimes referred to as Latent Profile Analysis (Bartholomew & Knott, 1999).

Recall that latent classes are defined such that as the effect of the latent properties are removed, all that remains is randomness among indicators. This definitional criterion is referred to as “conditional independence” and means that within latent classes, item

responses are statistically independent of one another. This is often most easily conceptualized within a diagnostic framework: On a symptom checklist, the presence or absence of one symptom is wholly unrelated to the presence or absence of any other symptom, except for being the result of the underlying illness. If not for the underlying illness, the likelihood of experiencing the symptoms together would be extremely low. For instance, observing unexplained hair loss, swollen glands, chest pain, double vision, and ringing in the ears in the absence of Lyme disease is highly unlikely. Symptom outcomes are *conditional* on having or not having the illness. For many applications, including the current study, the assumption of conditional independence is not met, and the LCA model has been extended to allow for correlation among observed outcomes by providing robust standard errors. For instance, items from the Mastery Scale may be assumed to be similar to items from the PSOC, such that responses to them are likely correlated.

Model Parameters

Within latent class models, two types of parameters are estimated: conditional response probability and class membership probability. Figure 9 shows the general latent class model with p observed continuous items, u , and categorical latent variable C . Conditional response probability refers to the probability that any one individual will respond in a particular way to any one item for every possible combination of item response and latent class membership. In this study, then, one conditional response probability parameter would be the probability that only a mother in an adaptive latent class would respond, “strongly disagree” to the item “the earlier a child is weaned from

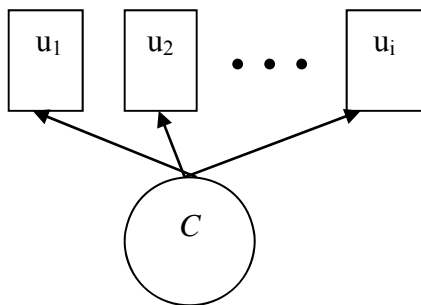


Figure 9. General latent class model where c is the latent class variable and u_1, u_2, \dots, u_i are the observed parenting variables.

its emotional ties to its parents, the better it will handle its own problems.” Conditional response probabilities are estimated for each of the other responses, “disagree,” “neither agree nor disagree,” and “strongly agree” for each item and conditional on membership in a given class. The class probability parameters specify the prevalence of each class in the population (i.e., relative frequency of class membership).

Model parameters were estimated using maximum likelihood (ML) criterion based on the expectation maximization (EM) algorithm developed by Dempster, Laird, and Rubin (1977). ML estimation refers to estimating the model parameters for which the observed data are the most likely. ML parameter estimation is used in this study to test whether a model with two distinct classes of parenting types is significantly more likely to produce the observed outcomes than a model with no distinct classes of parenting types. The EM algorithm is a two-step iterative process for computing the ML estimate where there is missing data. In step one, missing data are estimated given the observed data and a baseline parameter estimate. In the second step, the likelihood function is maximized based on the assumption that the missing data are known. The estimates of missing data from step one are used in place of the actual missing data. This two-step

process continues until (a) the likelihood of observing the actual data is maximized and (b) that maximum likelihood value is duplicated. At that point, the maximum likelihood value achieved is assessed relative to observing the actual data as a function of random error. The models in this study were fit using the Mplus (version 6.0, 2009) statistical package.

Ideally, the ML algorithm converges on the globally best solution—the one set of parameter values, out of all possible values, with the largest loglikelihood. Sometimes, though, the estimation algorithm converges on a *local maximum* solution. The algorithm continues running as the loglikelihood values increase. At the point where a change in a parameter estimate results in a drop, however slight, in the loglikelihood value, the algorithm stops fine-tuning parameter estimates, and repeats the process until, using the same parameter estimates, the loglikelihood value is duplicated. The algorithm does not allow for the possibility that the loglikelihood value, having dropped only slightly, may then continue to increase to its actual largest value, referred to as the global maximum. Imagine climbing a tall mountain. By climbing the steepest slope to the highest point, one would eventually reach the top of *that* peak. The summit, however, is across a saddle in the mountain and to reach it, one must go down then go up again. ML strategy is to continually move in an upward direction; downward movement is a signal that the “summit” has been reached.

To avoid a local solution, multiple starting values for the estimated parameters were considered (McLachlan & Peel, 2000). Obtaining the same loglikelihood value from one hundred sets of starting values ensured that the solution obtained was not a local

maximum.

Latent class analysis was used in the present study to empirically identify subgroups of mothers. Because parenting is a complex activity made up of multiple behaviors operating individually and together to impact child outcomes, examining any given parenting characteristic in isolation would be misleading. It was reasoned that interpretable profiles were most likely to come from a model that included important parenting constructs representing multiple dimensions of parenting. Therefore, dysfunctional attachment, undemandingness, dismissiveness, punitive parenting, parenting efficacy, perceived parenting mastery, and parenting competence were entered into the latent model as profile indicators.

While not a requirement that the indicators be measured on the same scale and have similar variances, they were put on the same scale (standardized) to help with model convergence (Muthén, 2002). Data from the CSA group of mothers and the reference group of mothers were standardized together, making comparisons between group profiles interpretable. For each of the two groups, two-, three-, and four- class models were tested against a single-class model that would be indicative of a homogeneous population.

Model Fit

The appropriate number of classes was determined by comparing the goodness of fit of a four-class model with that of a three-class model, and the fit of a three-class model with that of a two-class model. The Akaike Information Criteria (AIC; Akaike, 1974) and sample size-adjusted Bayesian Information Criterion (SSA-BIC; Schwartz,

1978) measure the efficiency of a model in its ability to predict the observed data. Unexplained variation in the outcome variable, in this case the latent class variable, increases the value of the SSA-BIC. Therefore, when comparing the efficiency (i.e., fit) of the estimated models, the model with the lower SSA-BIC value was the one to be preferred. The SSA-BIC imposes a penalty as the number of estimated parameters increases, which is why it was used as a model fit index in the present study's analyses. Further, Nylund, Asparouhov, and Muthén's (2007) simulation study showed that SSA-BIC outperforms other information indexes such as Lo, Mendell, and Rubin (LMR; Lo, Mendell, & Rubin, 2001). Simulation studies on mixture models where data are simulated from a "true model" in which the "right" number of groups is known (e.g., Collins, Fidler, Wugalter, & Long, 1993; Enders & Tofighi, 2007; Henson, Reise, & Kim, 2007; Magidson & Vermunt, 2004; Nylund et al., 2007) also indicate that statistical tests of significance guide selection of the correct number of classes, and that the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000) consistently performs the best. The BLRT compares the estimated model to a model with one class fewer than the estimated model. The p value obtained in the test is an approximation of the probability that the data have been generated by the model with one less class, thus, a low p value indicates that the model with one less class is rejected in favor of the estimated model. The BLRT was used in the present study to determine whether a three-class solution fit the data better than a two-class solution.

Class Membership Correlates

Lubke and Muthén (2007) showed that inclusion of covariates in the LCA can

improve parameter coverage and classification accuracy. Since one of the major goals of this study is to develop a model to predict parenting class membership among the CSA survivors, non-parenting related variables associated with CSA were entered into the model as covariates to parenting class membership. Given the risk factor status of depression, drug abuse, alcohol abuse, and intimate partner relationship difficulties on parenting behaviors, these variables were logically interpreted as potential predictors of future parenting profiles among CSA survivors. Each was entered into the LCA model individually. Variables whose parameter estimate was significant at $p < .15$ were then entered into the model simultaneously. Correlates significant at $p \leq .05$ were included in the final model.

Monte Carlo Simulation

Sample size adequacy depends on many factors, including the number of parameters to be estimated, variable distributions, missing data patterns, and reliability of the measures. Standard errors are especially sensitive to sample size disparities, and biased standard errors result in untrustworthy estimation of confidence intervals, referred to as coverage (Kenney & Keeping, 1962). A Monte Carlo simulation study was conducted for the purpose of determining whether the CSA sample in this study ($n = 106$) is sufficient to produce unbiased parameter estimates, unbiased standard errors, and good coverage (confidence level) in an LCA model with up to 38 parameters (seven indicators, two—four latent classes, and one—two maternal well-being correlates, plus error terms associated with each parameter estimate). In this Monte Carlo simulation, data for the

continuous dependent variables (the indicators) were generated according to a multivariate normal distribution, conditional on the independent variables (the latent classes). Replication samples (10,000) were drawn to ensure estimate stability, and the LCA model was estimated for each sample. Parameter values and standard errors were then averaged across all 10,000 samples.

Several criteria were examined in the Monte Carlo simulation study to evaluate the adequacy of the sample size (Muthén & Muthén, 2002). Table 11 shows partial output from the Mplus Monte Carlo LCA model. All outputs from the analyses are found in Appendix B. Following is a description of how the output was used to evaluate the criteria for sample size adequacy. First, parameter and standard error bias did not exceed 10 percent. Parameter bias was evaluated by first, calculating the difference between the population estimate (column 1), set by the researcher based on the parameter value observed when the LCA was run on the actual sample of 106, and the estimates averaged over the 10,000 replications (column 2). This difference was then divided by the population estimates (Muthén & Muthén, 2002). Standard error bias was evaluated in the same fashion from the output in columns three and four. The second criterion was that the standard error bias for the parameter for which power was being assessed, in this case, the latent class variable, did not exceed 5% (columns 3 and 4, last row). The third criterion was that coverage remained between 0.91 and 0.98 (column 6). The seventh column displays the information used in the power analysis. It is the proportion of replications in which the null hypothesis, that the parameter equals 0, is rejected at $\alpha = .05$ for a two-tailed test. For parameters with population estimates not equal to 0, as is

Table 11

Partial Mplus Output for Monte Carlo Simulation Study

	1	2	3	4	5	6	7
Variables	Population	Estimates Average	SD	S.E. average	M. S. E.	95% coverage	% Sig. Coeff.
Latent class 1							
Means							
Y1	1	0.9979	0.1266	0.1254	0.016	0.94	1
Y2	1	0.9994	0.1275	0.1253	0.0163	0.946	1
Y3	1	0.9993	0.1273	0.1255	0.0162	0.943	1
Y4	1	1.0005	0.1276	0.1253	0.0163	0.943	1
Y5	1	0.9994	0.1273	0.1253	0.0162	0.942	1
Y6	1	1.0016	0.1274	0.1255	0.0162	0.945	1
Y7	1	1.0007	0.1269	0.1255	0.0161	0.944	1
Y8	1	0.9987	0.1275	0.1255	0.0162	0.944	1
Y9	1	1	0.1269	0.1253	0.0161	0.941	1
Variances							
Y1	1	0.981	0.1341	0.1315	0.0183	0.92	1
Y2	1	0.9807	0.1351	0.1315	0.0186	0.918	1
Y3	1	0.9817	0.1348	0.1318	0.0185	0.92	1
Y4	1	0.9808	0.134	0.1316	0.0183	0.92	1
Y5	1	0.9808	0.1362	0.1316	0.0189	0.918	1
Y6	1	0.9825	0.1345	0.1317	0.0184	0.919	1
Y7	1	0.9801	0.1339	0.1313	0.0183	0.921	1
Y8	1	0.9809	0.1357	0.1313	0.0188	0.913	1
Y9	1	0.9805	0.1369	0.1316	0.0191	0.912	1
Latent class 2							
Means							
Y1	-1	-0.999	0.1508	0.1481	0.0228	0.942	1
Y2	-1	-0.9994	0.151	0.1481	0.0228	0.94	1
Y3	-1	-0.9993	0.1503	0.1478	0.0226	0.94	1
Y4	-1	-0.9987	0.1523	0.1482	0.0232	0.938	1
Y5	-1	-0.9979	0.1514	0.148	0.0229	0.939	1
Y6	-1	-0.9992	0.1521	0.1481	0.0231	0.938	1
Y7	-1	-1.0016	0.1503	0.1476	0.0226	0.94	1
Y8	-1	-0.9999	0.1503	0.1478	0.0226	0.941	1
Y9	-1	-0.9993	0.1487	0.1481	0.0221	0.946	1

(table continues)

	1	2	3	4	5	6	7
Variables	Population	Estimates Average	<i>SD</i>	S.E. average	M. S. E.	95% coverage	% Sig. Coeff.
Variances							
Y1	1	0.981	0.1341	0.1315	0.0183	0.92	1
Y2	1	0.9807	0.1351	0.1315	0.0186	0.918	1
Y3	1	0.9817	0.1348	0.1318	0.0185	0.92	1
Y4	1	0.9808	0.134	0.1316	0.0183	0.92	1
Y5	1	0.9808	0.1362	0.1316	0.0189	0.918	1
Y6	1	0.9825	0.1345	0.1317	0.0184	0.919	1
Y7	1	0.9801	0.1339	0.1313	0.0183	0.921	1
Y8	1	0.9809	0.1357	0.1313	0.0188	0.913	1
Y9	1	0.9805	0.1369	0.1316	0.0191	0.912	1
Categorical latent variable							
Mean							
Class # 1	-0.359	-0.3629	0.1447	0.1444	0.021	0.951	0.7772

the population parameter estimate for the latent class variable (column 1) in our LCA, this value, .78 (column 7, bottom row) is an estimate of power (i.e., the probability that we would reject the null when it is false). In summary, the sample of 106 is adequate to ensure unbiased parameter and standard error estimates in the LCA model and with this sample, we have 78% power.

CHAPTER IV

RESULTS

As hypothesized, distinct subgroups were found among the sample of mothers who are CSA survivors that were not observed in the non-CSA reference group. The AIC, sample size-adjusted SSA-BIC and BLRT values for the one- to four-class solutions are shown in Table 12 for the CSA group; the values for the one- and two-class solutions for the reference group are shown in Table 13. These results showed that according to the SSA-BIC and the AIC, a model with three latent classes performed best for the CSA group, as this was the solution with the lowest values for both criteria. The BLRT yielded highly significant p-values for the comparison of two classes over one, and for three classes over two. Consistent with the AIC and SSA-BIC, the BLRT for four classes over three was nonsignificant, showing that adding a fourth class to the model did not improve fit significantly. Therefore, I selected the three-class model, which appeared to be the most parsimonious description of the CSA data.

The AIC and SSA-BIC fit indices for the two class model with the reference group data are not improved over the indices for the single-class model. The BLRT for two classes over one was nonsignificant, showing that a two-class model did not fit the reference group data better than a single-class model, indicating that the reference group of mothers was, in fact, a homogeneous group, with respect to the parenting indicators.

Three-Class Model

Table 14 shows the CSA class membership statistics for the three-class solution.

Table 12

CSA Group LCA Fit Index Values (N = 106)

No. classes	No. parameters	<i>P</i> BLRT	AIC	SSA-BIC	# of classes < 1%	# of classes < 5%
4	38	.1600	2084.96	2066.11	0	1
3	30	.0000	2066.44	2051.57	0	0
2	22	.0000	2066.99	2055.08	0	0
1	14	n.a.	2761.64	2752.88	n.a.	n.a.

Table 13

Reference Group LCA Fit Index Values (N = 158)

No. classes	No. parameters	<i>P</i> BLRT	AIC	SSA-BIC	# of classes < 1%	# of classes < 5%
2	22	.5001	2837.46	2835.67	1	1
1	14	n.a.	2119.02	2117.76	n.a.	n.a.

Table 14

Latent Class Membership Statistics for the Three-Class Solution

Class	Probability of expected class membership		Class size	
	Mean		N	%
1	.952		56	53.2
2	.962		34	31.7
3	.969		16	15.2

In LCA, the probability of belonging to any one of the different classes is calculated for all participants, and an individual can be assigned to the latent class for which her assignment probability is maximized. The mean assignment probabilities for all of the mothers assigned to the same class can be interpreted as reliability measures for the class assignment. The mean probabilities for each of the three classes are well above .90, indicating high classification reliabilities.

Class Characteristics

Recall that the scores on each of the indicators were standardized using both the CSA sample and the reference sample together. As the plot of estimated mean standard scores in Figure 10 shows, the reference class was within 0.25 standard deviations from the mean of each of the seven parenting indicators, an indication that this sample performed well as a reference class.

Referring to Figure 10, 53% of the CSA sample were classified as members of the first parenting class. This class of mothers is similar to the reference sample along multiple parenting indicators. They are neither undemanding nor punitive with their children, and they are less dismissive than the reference sample class. They are nearly identical to the reference sample class in their report of parenting efficacy and their sense of parenting competence, and report slightly higher levels of feelings of mastery as a parent. This class of mothers is most distinguishable from the reference sample class by significantly higher levels of dysfunction in their attachments with their children. This class of mothers is separated from the reference sample by greater than a full standard

deviation; on average, the mothers in this class scored in the 73rd percentile on the dysfunctional attachment subscale of the PSI, whereas the reference sample scored in the 50th percentile. The label “diligent/struggling” was assigned to this class, as they appear to be functioning well in most areas, but struggling in their perceptions of their attachments with their children.

The next latent class is comprised of 32% of the CSA mothers. Referring once again to Figure 10, contrary to the diligent/struggling class, this class of mothers is dissimilar to the reference sample mothers along five of the seven parenting indicators. This class is approximately one-half standard deviation higher on punitive parenting than the reference sample and .75 standard deviations higher on dismissive parenting. While differences of less than one standard deviation may not be meaningfully interpreted at the

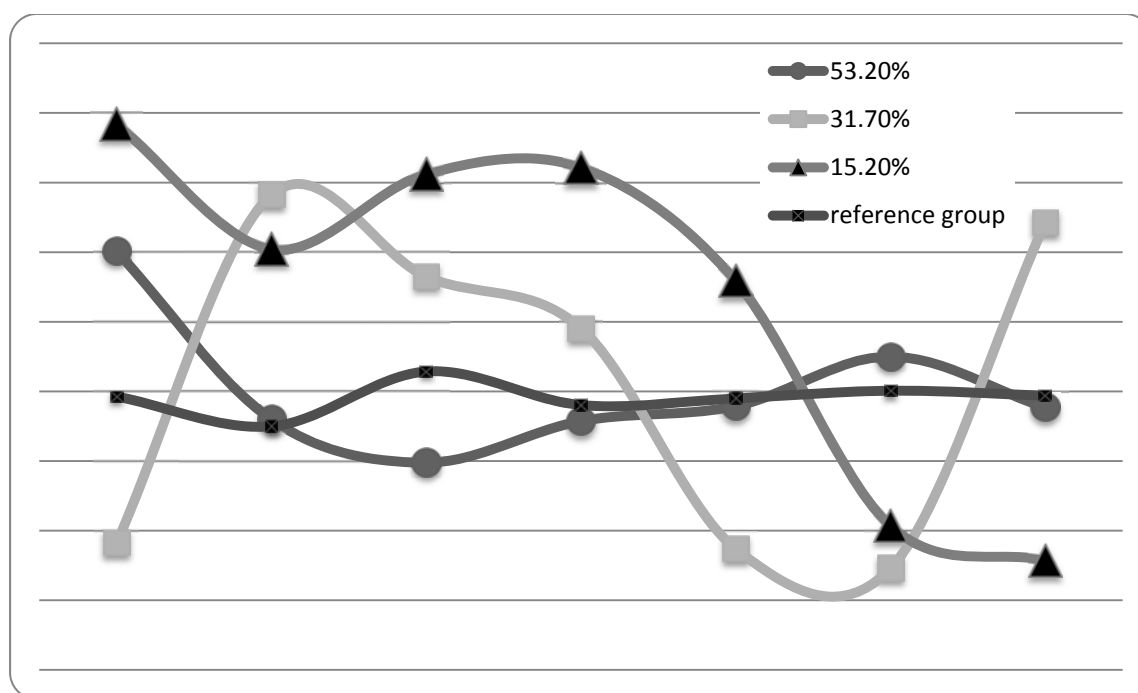


Figure 10. Plot illustrating the parenting profiles from the three-class latent model using standardized scores ($M = 0$, $SD = 1$).

level of individual parenting constructs, they nonetheless contribute substantially to an overall profile that is clearly and significantly distinct from the reference group profile. On dysfunctional parenting, this class is a full standard deviation lower than the reference sample mothers, and their mean score on this subscale was below the 30th percentile. This would indicate that these moms perceive their attachments with their children as minimally or not at all dysfunctional. On parenting competence, this class of mothers scores well over a full standard deviation above the reference sample, in the 90th percentile. This class also scored one and a half standard deviations above the reference sample in undemanding parenting. On punitive and dismissive parenting, this class is within one half a standard deviation of the reference sample. On parenting efficacy and a sense of mastery as a parent, this class scored well below a standard deviation of the reference sample. The label assigned to this class was “child-centered,” as they appear to be especially undemanding of and attached to, their children.

Finally, only 15% of the mothers in the CSA sample were classified as members of the third class. Unlike the first two classes, this class of mothers is dissimilar to the mothers in each of the first two classes, as well as the reference sample, along each of the seven parenting indicators. These mothers scored in the 90th percentile for dysfunctional attachment (Figure 11), fully two standard deviations above the reference sample (Figure 10). This class was also more than one and a half standard deviations above the reference group and the diligent class on dismissive parenting, and one to one and a half standard deviations above the child-centered class, diligent class, and the reference group on punitive parenting. Interestingly, while they were just within a standard deviation on

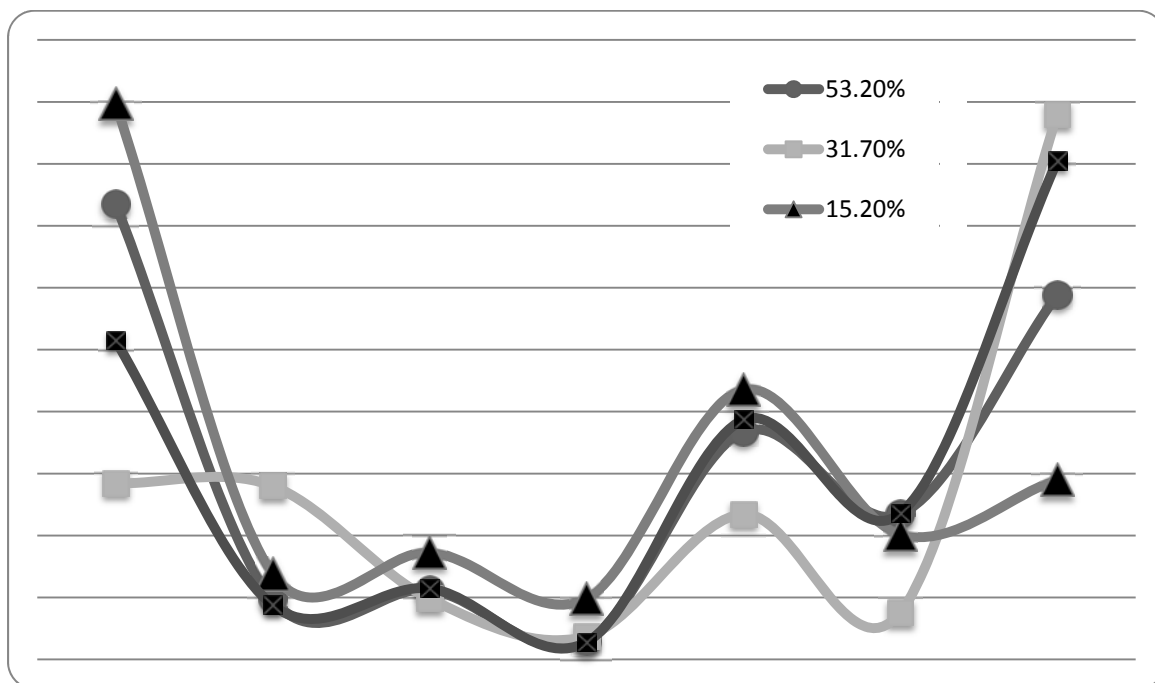


Figure 11. Plot illustrating the parenting profiles from the three-class latent model using percentiles (PSI subscales) and raw scores.

parenting efficacy, they were below the reference sample by one full standard deviation on sense of mastery as a parent, and two standard deviations below on parenting competence. This class was assigned the label “detached” from their role as parent.

In summary, the three latent classes are well represented by a combination of mothers’ parenting behaviors, attitudes, and perceptions of themselves in their parenting roles. Table 15 summarizes sample characteristics by class.

Multinomial Logistic Regression

Logistic regression was conducted to determine the impact of the four covariates to predict membership of one or more of the three latent classes that constituted the

Table 15

CSA Sample Characteristics by Class

Variable	53% Diligent/struggling		32% Child-centered		15% Detached		Reference group (<i>n</i> = 158)		CSA full sample (<i>n</i> = 106)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mother age	28	5.3	28	6.1	26	6.0	23	1.0	26	5.2
Highest level of education	13.29	2.2	14.4	2.3	12.6	2.2	15.5	3.3	13.5	3.6
Child age (years)	2y 10 mo		2y 7 mo		3 yr		3.2	1.4	3.5	.6
Median income	< \$9,000		< \$9,000		< \$9,000		< \$9,000		< \$9,000	
Intimate partner support (min = 12; max. = 30)	18.4	2.8	21.6	4.3	7.1	3.4	27.5	4.8	15.7	3.4
Depressive symptoms (min = 0; max. = 29)	12.2	4.8	14.61	3.8	17.59	4.6	11.9 24% in clinical range	4.5	14.8 36% in clinical range	6.3

dependent variable categories. Results of the multinomial logistic regression are summarized in Table 15. Of the covariates initially considered for inclusion, only two, maternal depression and intimate partner support, remained in the model as statistically significantly related to class membership. Neither interpersonal violence, drug use, nor alcohol use were significant in the logistic regression, and were dropped from the model. Of the three classes, the profile most similar to that of the non-CSA reference sample was that of the diligent/struggling mothers. This class, therefore, was the most logical selection as a reference class in the logistic regression model.

Referring to Table 16, for a one standard deviation increase in depression, the odds of membership in the child-centered class, as opposed to the diligent/struggling class decrease by one third (1 - .66). For the same increase in depression, however, the odds of membership in the detached class, as opposed to the diligent/struggling class

Table 16

Multinomial Logistic Regression Coefficients and Odds Ratios for the Three-Class Model with Covariates and the 53% Class, as the Reference Class

Model	Effect	coefficient	S.E.	Odds ratio
Diligent/struggling (53%) as reference class				
Child-centered (32%)	Depression	-.42**	.097	.66
	Intimate partner support	.82	.648	-----
Detached (15%)	Depression	.40**	.190	1.49
	Intimate partner support	.68	.514	-----
Child-centered (32%) as reference class				
Detached (15%)	Depression	.96**	.420	2.61
	Intimate partner support	-1.05**	.433	.35

* Statistically significant at $\alpha < .01$; ns: Statistically nonsignificant at $\alpha \leq .05$

increase by half ($1 + .49$). Further, as depression increased by one standard deviation, the odds of membership in the detached class were 4.75 times the odds of membership in the diligent/struggling class.

CHAPTER V

DISCUSSION

Abell, Clawson, Washington, Bost, and Vaughn (1996); Harrison, Wilson, Pine, Chan, and Buriel (1990); and others have emphasized the need to examine the situational conditions that form the context to which parenting behaviors and attitudes are a response. In this study, I set out to examine from a person-oriented perspective, the parenting profiles of mothers who had been sexually abused during their childhood. It was hypothesized that with respect to parenting outcomes, CSA mothers are not a homogenous population, and that discrete subgroups of mothers would be experiencing unique challenges. This hypothesis was supported by the results of the LCA, where parenting profiles were examined through the bifocal lenses of parenting styles and mothers' perceptions of themselves in their parenting role.

Attachment theory offers one explanation as to the relation between CSA and the highly dysfunctional parenting profile exhibited by the mothers of the detached class. Endorsement of the items of the PSI dysfunctional attachment scale such as "It is hard to understand my child's needs," "I feel uncomfortable holding my child," and "My child does things just to be mean," is a powerful indication of a disruption in the normative bonding attachment relationship between mother and child. These mothers are profiled as subscribing to highly dismissive parenting attitudes (e.g., "Children who are given too much love by their parents will grow up to be stubborn and spoiled," and "Parents spoil their children by picking them up and comforting them when they cry"). Alexander (1992) suggested that the long-term interpersonal effects of CSA are mediated by the

survivor's attachment style with her own mother. CSA often triggers insecure or disorganized attachment among victims; this attachment style may be maintained through adulthood, and manifests in the form of poor functioning in interpersonal contexts (Courtois, 1988; Finklehor, 1984; Herman, 1992; National Research Council, 1993; Russell, 1986), including survivors' relationships with their own children. It may be that the betrayal and violation by an adult, often a family member or known and trusted individual, negatively impacts the development of attachment patterns into adulthood. These attachment patterns may be the catalyst to the formation of internal working models which directly influence mothers' perceptions and expectations in their relationships with their own children and may lead to distortions in their parenting role.

In the case of the 15% of mothers in the detached class, distortions are evident; they are exceptionally low on parenting mastery and competence, yet highest in parenting efficacy. Relative to the reference sample, the mothers in this class were on the extreme ends of dysfunctional attachment, dismissive parenting practices, and punitive parenting; yet, their high parenting efficacy reflects their positive perceptions of themselves as parents and feeling comfortable in that role. Consistent with a dismissing internal working model of attachment, these mothers may have developed strategies in which they maintain a positive view of themselves, but are not comfortable with the feelings of closeness characteristic of a nondysfunctional attachment relationship between mother and child (Bartholomew, 1993; Bowlby, 1977). These findings are consistent with previous research which found that the long-term effects of CSA often cluster around attachment issues and that survivors often vacillate between seeking and fearing

attachment (Sanderson, 2006).

For the 32% of the CSA mothers in the child-centered class, the reverse seems to be the case. These mothers, although lowest in dysfunctional attachment and highest in parenting competency, nevertheless perceived themselves as powerless and ineffectual in their parenting role. Whereas the detached class was high in parenting efficacy, this child-centered class was lowest in parenting efficacy. Their perceptions of themselves as mothers were distorted such that even though they possessed the necessary knowledge and skill, and were highly invested in and valued their parental role, they did not perceive themselves as competent parents. Bowlby (1977) argued that a key feature in the working model of the self is one's perception of how acceptable or unacceptable they are in the eyes of their attachment figures. Despite scoring high on parenting competence and low on dysfunctional attachment, these mothers may have developed internal working models of themselves as "unacceptable," a phenomenon not uncommon among CSA survivors. A combination of acquired beliefs and expectations and learned maladaptive behaviors on the part of women sexually abused as children are thought to result in feelings of worthlessness and low self-esteem in a relationships context (Tebbutt, Swanston, Oates, & O'Toole, 1997).

The majority of mothers in the CSA sample belonged to the class that in all but one respect, mirrored the profile of the non-CSA reference sample. The mothers in this class reported that they were not particularly undemanding of their child, nor were they dismissive or punitive toward their child. They did, however, perceive dysfunction in their attachment relationship with their child. Given their own reports of parenting

competently and of valuing and feeling confident in their parenting role, it may be the case that while they perceive their attachment relationship with their child as dysfunctional, their child is in fact, experiencing a parent who attends to their needs sufficiently for the child to be securely attached. Bowlby (1977) presented the internal working models concept as a mediator of attachment-related experiences. Previous literature supports this theory in the context of CSA and adult intimate relationships (Courtois, 1988; Davis & Petretic-Jackson, 2000; Finklehor, 1984; Herman, 1992; Russell, 1986; Sanderson, 2006), where CSA survivors often develop an impaired ability to form healthy trusting relationships. The current findings support this theory in the context of CSA and future parent-child attachment relationships: 68% of the CSA sample perceived their attachment relationship with their child as highly dysfunctional, relative to the non-CSA reference sample.

Evidence linking CSA to long-term adverse effects indicates a great deal of heterogeneity across victims and outcomes, adding to consistent findings of heterogeneity in outcomes with many high-risk populations (Rutter, 1987). These findings lead us to investigations of mechanisms of resiliency. This study examined the link between CSA and future parenting outcomes on the assumption of heterogeneity within the CSA population in order to better understand the mechanisms of risk and resilience in future parenting by CSA survivors. While the effects of sexual abuse are varied, CSA is clearly a liability to overcome in the development of healthy relationships. Having the support of an intimate partner appears to play an important protective role with regard to mothers' care of their children, and in the development of functionally healthy attachments

between CSA mothers and their children. Mothers in the CSA sample who felt a high level of support from their intimate partners were only a fraction as likely to exhibit a detached parenting profile as mothers who did not feel supported by their partner. These findings are consistent with research regarding resilience in mothers who are CSA survivors. For instance, Wright and colleagues (2005) found intimate partner support to be a strong protective factor in buffering the effects of depression on parenting competence in a sample of 79 mothers with a history of CSA who had a child living at home with them.

Depression has long been a risk factor associated with impaired parental functioning (Bettes, 1988; Campbell, Cohn, & Meyers, 1995; Hamilton, Jones, & Hammen, 1993; Lovejoy, 1991). Findings regarding depression's effect on CSA survivors with regard to parenting are, therefore, not surprising. Depression was an important predictor of classification into the profile where mothers had not fully embraced their parental role compared to the profiles where mothers were invested and competent.

Limitations and Directions for Future Research

Generalization of findings beyond this sample of CSA survivors should be carried out with caution. Parenting occurs in the context of very specific family and community situations. One of the biggest effects on parenting is socio-economic status (Hoff, Laursen & Tardif, 2002).

Parents who are more highly educated tend to have better financial security; this

reduction of potential stressors can have a significant effect on parenting. Nearly half of the women in this study reported incomes of less than \$15,000 per year. A similar study with a more affluent sample of mothers, could potentially yield different results and lead to alternate conclusions.

One overarching aspect that affects parenting is the family's ethnic culture (Brooks-Gunn & Markman, 2005). Among different cultural groups, parenting involves different kinds or amounts of behaviors, depending on parents' beliefs and values. As the majority of mothers in this study were African-American, future person-oriented studies should be carried out with diverse samples if findings are to be generalized. It is interesting to note, however, that the findings of this study are not consistent with reports that power-assertive and harsh or punitive parenting behaviors are more likely to be engaged in by African-American parents, and particularly in the context of economic hardship or insufficiency (McLoyd, 1990), as is the case with a substantial proportion of our CSA sample. Seventy-three percent of the mothers in the CSA sample were African-American, and 40% reported incomes well below the poverty line, yet the majority of mothers in this sample are characterized by low levels of punitive parenting.

In a study of the effects of early relational deprivation in adopted children from eastern Europe, Judge (2004) provided a modicum of convergent validity (r ([124] = -.46, $p \leq .00$) between the attachment subscale in the parent domain of the PSI and children's security of attachment assessed using items from the Q-sort (Waters & Deane, 1985) measure of secure attachment. Children of parents who scored in the high range on the attachment scale of the PSI, tended to score very low on the Q-sort measure of secure

attachment. This attachment subscale was not designed, however, as a stand-alone instrument to draw conclusions regarding the attachment style of a child. In the current study, this subscale was used exclusively as an indicator of mothers' perceptions of their attachment with their child and conclusions beyond those are not warranted.

Depression and intimate partner support were considered as antecedent covariates in the multinomial logistic regression model. While the parenting literature is rife with evidence that maternal depression impedes mothers' capacity to parent suitably (e.g., Bettes, 1988; Campbell et al., 1995; Hamilton et al., 1993; Lovejoy, 1991; Mash & Johnston, 1983a, 1983b; Webster-Stratton, 1989), there is not as strong a basis for the causal ordering assumption that involvement with a less-than-supportive intimate partner is causally related to impaired parenting. It is not inconceivable that the impaired early relationship with her children precedes a mother's perceived lack of support from her intimate partner.

Finally, this study relied on retrospective reports of a history of CSA. Prospective studies with confirmed victims of sexual abuse would enhance the validity and specificity of conclusions regarding the association between CSA and future parenting.

Implications

Knowledge about CSA survivors' parenting characteristics and relationships with their children can illuminate directions for intervention to help CSA mothers cope with unique parenting difficulties associated with their abusive childhood experiences. Ultimately, such interventions such as dyadic Child-Parent Psychotherapy (Leiberman,

Weston, & Pawl, 1991) can help to disrupt intergenerational ripple effects originating from maternal sexual trauma. Cicchetti, Rogosch, and Toth (2000) reported that child-parent psychotherapy was effective in increasing attachment security in depressed mother-toddler dyads and Fraiberg, Adelson, and Shapiro (1975) found dyadic child-parent psychotherapy helpful in addressing mothers' tendency to project unconscious material regarding the CSA onto their child.

The effects of CSA on future parenting patterns are similar to the effects of CSA on other well-studied, long term effects in that there is substantial variation across victims. The findings from this study confirm the need to evaluate the effects of CSA on women from a person-oriented approach to better understand these differences and target interventions.

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APPENDICES

Appendix A

Study Validity Rating Protocol

Study Validity Rating Protocol

Author _____

Year _____

0 = not a plausible threat to the study's internal validity

Threats to internal validity _____

1 = potential minor problem to inferences about a relation between independent variables and outcome(s) of interest; by itself not likely to account for substantial portion of observed results

History _____

Mortality _____

Instrumentation _____

2 = plausible alternative explanation which by itself could account for substantial amount of the observed results

Selection _____

3 = by itself could explain most or all of the observed results

Regression _____

General Rating of Validity (1 = high, to 5 = low) _____

Appendix B
Latent Class Analysis Output

Latent Class Analysis Output

Mplus VERSION 5.2
MUTHEN & MUTHEN
01/11/2011 3:11 PM

INPUT INSTRUCTIONS DATA:

FILE IS G:\Thesis\Final_in_out_data\Case_stnd_with_controls_covariates.dat;
VARIABLE:
MISSING ARE ALL (-99);

NAMES ARE id puntiv dismis psiatper undmd mastery selfef
psicoper ces_d int_prt;

USEVAR are puntiv dismis psiatper undmd mastery selfef
psicoper;

AUXILIARY=id;
CLASSES = class (3);

ANALYSIS:
type = mixture;
OPTSEED = 898745;
LRTSTARTS = 0 0 40 10;
MODEL: %OVERALL%

OUTPUT:
TECH7 TECH14;
SAVEDATA:
FILE IS G:\Thesis\Final_in_out_data\final_class_probs_.dat;
SAVE= CPROBABILITIES;

!PLOT:
! TYPE = PLOT3;
!SERIES = puntiv(1) dismis(2) attach(3) undmd(4) mastery(5) selfef(6) comp(7);

!LRTBOOTSTRAP =
!STARTS =

SUMMARY OF ANALYSIS

Number of groups 1
Number of observations 106

Number of dependent variables 7
Number of independent variables 0
Number of continuous latent variables 0
Number of categorical latent variables 1

Observed dependent variables

Continuous
 PUNTIV DISMIS PSIATPER UNDMD MASTRY SELFEP
 PSICOPER

Observed auxiliary variables
 ID

Categorical latent variables
 CLASS

Estimator MLR

Information matrix OBSERVED

Optimization Specifications for the Quasi-Newton Algorithm for
 Continuous Outcomes

Maximum number of iterations 100

Convergence criterion 0.100D-05

Optimization Specifications for the EM Algorithm

Maximum number of iterations 500

Convergence criteria

Loglikelihood change 0.100D-06

Relative loglikelihood change 0.100D-06

Derivative 0.100D-05

Optimization Specifications for the M step of the EM Algorithm for
 Categorical Latent variables

Number of M step iterations 1

M step convergence criterion 0.100D-05

Basis for M step termination ITERATION

Optimization Specifications for the M step of the EM Algorithm for
 Censored, Binary or Ordered Categorical (Ordinal), Unordered

Categorical (Nominal) and Count Outcomes

Number of M step iterations 1

M step convergence criterion 0.100D-05

Basis for M step termination ITERATION

Maximum value for logit thresholds 15

Minimum value for logit thresholds -15

Minimum expected cell size for chi-square 0.100D-01

Maximum number of iterations for H1 2000

Convergence criterion for H1 0.100D-03

Optimization algorithm EMA

Random Starts Specifications

Random seed for analysis 898745

Input data file(s)

G:\Thesis\Final_in_out_data\Case_stnd_with_controls_covariates.dat

Input data format FREE

SUMMARY OF DATA

Number of missing data patterns 4

Number of y missing data patterns 4

Number of u missing data patterns 0

COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value 0.100

PROPORTION OF DATA PRESENT FOR Y

Covariance Coverage

PUNTIV DISMIS PSIATPER UNDMD MASTRY

PUNTIV	1.000				
DISMIS	1.000	1.000			
PSIATPER	0.981	0.981	0.981		
UNDMD	1.000	1.000	0.981	1.000	
MASTRY	0.991	0.991	0.972	0.991	0.991
SELFEF	0.991	0.991	0.972	0.991	0.991
PSICOPER	0.972	0.972	0.972	0.972	0.962

Covariance Coverage

SELFEF PSICOPER

SELFEF	0.991
PSICOPER	0.962 0.972

THE MODEL ESTIMATION TERMINATED NORMALLY

TESTS OF MODEL FIT

Loglikelihood

H0 Value -2293.172
 H0 Scaling Correction Factor 1.655
 for MLR

Information Criteria

Number of Free Parameters 30
 Akaike (AIC) 2066.444
 Bayesian (BIC) 2226.246
 Sample-Size Adjusted BIC 2051.572
 $(n^* = (n + 2) / 24)$

FINAL CLASS COUNTS AND PROPORTIONS FOR THE LATENT CLASSES
 BASED ON THE ESTIMATED MODEL

Latent
 Classes

1	34.04914	0.32122
2	53.62096	0.50586
3	18.32990	0.17292

FINAL CLASS COUNTS AND PROPORTIONS FOR THE LATENT CLASS PATTERNS
 BASED ON ESTIMATED POSTERIOR PROBABILITIES

Latent

Classes

1 34.04914 0.32122

2 53.62099 0.50586

3 18.32988 0.17292

CLASSIFICATION QUALITY

Entropy 0.903

CLASSIFICATION OF INDIVIDUALS BASED ON THEIR MOST LIKELY LATENT CLASS

MEMBERSHIP

Class Counts and Proportions

Latent

Classes

1 32 0.30189

2 57 0.53774

3 17 0.16038

Average Latent Class Probabilities for Most Likely Latent Class Membership (Row)

by Latent Class (Column)

1 2 3

1 0.952 0.022 0.000

2 0.048 0.962 0.041

3 0.000 0.016 0.969

MODEL RESULTS

Two-Tailed

Estimate S.E. Est./S.E. P-Value

Latent Class 1

Means

PUNTIV 2.927 0.414 7.073 0.000

DISMIS 9.800 0.616 15.911 0.000

PSIATPER 27.591 5.351 5.156 0.000

UNDMMD 8.862 1.632 5.431 0.000

MASTRY 27.481 1.985 13.843 0.000

SELFEF 33.504 2.036 16.456 0.000

PSICOPER 12.912 12.679 1.018 0.309

Variances

PUNTIV 6.412 1.405 4.563 0.000

DISMIS 8.227 1.589 5.178 0.000

PSIATPER 478.764 273.912 1.748 0.080

UNDMMD 13.005 3.931 3.308 0.001

MASTRY 4.094 2.225 1.840 0.066

SELFEF 10.837 1.998 5.423 0.000

PSICOPER 336.946 196.778 1.712 0.087

Latent Class 2

Means

PUNTIV 3.832 1.051 3.646 0.000

DISMIS 11.225 0.733 15.322 0.000
 PSIATPER 60.919 21.488 2.835 0.005
 UNDMMD 9.557 1.793 5.331 0.000
 MASTRY 23.582 1.504 15.681 0.000
 SELFEF 38.574 1.978 19.503 0.000
 PSICOPER 40.727 15.610 2.609 0.009

Variances

PUNTIV 6.412 1.405 4.563 0.000
 DISMIS 8.227 1.589 5.178 0.000
 PSIATPER 478.764 273.912 1.748 0.080
 UNDMMD 13.005 3.931 3.308 0.001
 MASTRY 4.094 2.225 1.840 0.066
 SELFEF 10.837 1.998 5.423 0.000
 PSICOPER 336.946 196.778 1.712 0.087

Latent Class 3

Means

PUNTIV 6.867 3.173 2.164 0.030
 DISMIS 13.118 2.733 4.800 0.000
 PSIATPER 72.259 5.745 12.578 0.000
 UNDMMD 13.572 4.546 2.986 0.003
 MASTRY 20.106 2.029 9.908 0.000
 SELFEF 42.969 3.904 11.005 0.000
 PSICOPER 67.913 11.411 5.952 0.000

Variances

PUNTIV 6.412 1.405 4.563 0.000
 DISMIS 8.227 1.589 5.178 0.000
 PSIATPER 478.764 273.912 1.748 0.080
 UNDMMD 13.005 3.931 3.308 0.001
 MASTRY 4.094 2.225 1.840 0.066
 SELFEF 10.837 1.998 5.423 0.000
 PSICOPER 336.946 196.778 1.712 0.087

Categorical Latent Variables

Means

CLASS#1 0.619 2.121 0.292 0.770
 CLASS#2 1.073 1.597 0.672 0.502

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix 0.340E-03
 (ratio of smallest to largest eigenvalue)

TECHNICAL 7 OUTPUT

SAMPLE STATISTICS WEIGHTED BY ESTIMATED CLASS PROBABILITIES FOR CLASS 1

Means

PUNTIV DISMIS PSIATPER UNDMD MASTRY

 1 2.927 9.800 27.591 8.862 27.481

Means

SELFEF PSICOPER

 1 33.504 12.912

Covariances

PUNTIV DISMIS PSIATPER UNDMD MASTRY

 PUNTIV 4.350
 DISMIS 3.830 9.799
 PSIATPER 2.224 -5.626 416.786
 UNDMD 1.995 5.540 -7.746 15.853
 MASTRY -0.097 -0.944 22.082 1.050 6.283
 SELFEF -0.015 -1.211 4.939 -2.976 -1.088
 PSICOPER 1.363 -7.329 76.713 -7.788 -15.745

Covariances

SELFEF PSICOPER

 SELFEF 14.944
 PSICOPER -5.687 169.339

SAMPLE STATISTICS WEIGHTED BY ESTIMATED CLASS PROBABILITIES FOR CLASS 2

Means

PUNTIV DISMIS PSIATPER UNDMD MASTRY

 1 3.832 11.225 60.919 9.557 23.582

Means

SELFEF PSICOPER

 1 38.574 40.726

Covariances

PUNTIV DISMIS PSIATPER UNDMD MASTRY

 PUNTIV 5.428
 DISMIS -0.191 7.773
 PSIATPER 8.826 9.931 526.705
 UNDMD 0.872 0.974 24.741 11.561
 MASTRY 0.388 -1.213 2.044 -0.149 2.970

SELFEF 1.234 -2.222 17.965 1.126 -0.187
 PSICOPER 10.567 -21.085 -22.386 5.480 -2.840

Covariances
 SELFEF PSICOPER

SELFEF 7.677
 PSICOPER 20.003 414.575

SAMPLE STATISTICS WEIGHTED BY ESTIMATED CLASS PROBABILITIES FOR CLASS 3

Means
 PUNTIV DISMIS PSIATPER UNDMD MASTRY

1 6.867 13.118 72.259 13.572 20.106

Means
 SELFEF PSICOPER

1 42.969 67.913

Covariances
 PUNTIV DISMIS PSIATPER UNDMD MASTRY

PUNTIV 13.120
 DISMIS 1.842 6.635
 PSIATPER 3.776 -4.097 450.898
 UNDMD -0.597 4.492 -13.623 11.938
 MASTRY -0.339 1.082 -8.420 -0.869 3.357
 SELFEF 5.270 0.446 -22.283 -0.436 -0.326
 PSICOPER -0.509 -0.213 -190.327 -8.437 -0.228

Covariances
 SELFEF PSICOPER

SELFEF 12.497
 PSICOPER 43.198 402.718

TECHNICAL 14 OUTPUT

Random Starts Specifications for the k-1 Class Analysis Model
 Number of initial stage random starts 10
 Number of final stage optimizations 2

Random Starts Specification for the k-1 Class Model for Generated Data
 Number of initial stage random starts 0

Number of final stage optimizations for the
initial stage random starts 0
Random Starts Specification for the k Class Model for Generated Data
Number of initial stage random starts 40
Number of final stage optimizations 10
Number of bootstrap draws requested Varies

PARAMETRIC BOOTSTRAPPED LIKELIHOOD RATIO TEST FOR 2 (H0) VERSUS 3 CLASSES

H0 Loglikelihood Value -2316.655
2 Times the Loglikelihood Difference 46.966
Difference in the Number of Parameters 8
Approximate P-Value 0.0000
Successful Bootstrap Draws 20