PATHWAYS TO SUBSTANCE USE AMONG SEXUALLY ABUSED GIRLS

by

Jennifer Ann Bailey

University of Arizona

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entitled Pathways to substance use among sexually abused girls
and recommend that it be accepted as fulfilling the dissertation requirement for the
Degree of Doctor of Philosophy

_____Date: 05/02/03
Lee Sechrest, Ph.D.

_____Date: 05/02/03
Richard Bootzin, Ph.D.

_____Date: 05/02/03
Judith Becker, Ph.D.

_____Date: 05/02/03
Roger Levesque, Ph.D.

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_____Date: 05/23/03
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TABLE OF CONTENTS

TABLE OF CONTENTS - *Continued*

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

This study aimed to 1) replicate existing research linking childhood sexual abuse and later substance use, 2) identify intergenerational parallels between the substance use and sexual victimization experiences of adolescent girls and their mothers, and 3) evaluate early pubertal timing, depressive self-concept, and behavioral under-control as potential pathways to substance use for sexually abused girls. Data were drawn from 150 mother-daughter pairs participating in a longitudinal study of the impact of domestic violence on the lives of women and children. Structural equations modeling revealed that girls' childhood sexual abuse was associated prospectively with their later substance use. This relationship held (retrospectively) for mothers as well. Mothers' risk for sexual abuse and substance use was transmitted to their daughters. Early pubertal timing, depressive self-concept, and behavioral under-control among girls were all predicted by childhood sexual abuse. Only behavioral under-control was, in turn, related to adolescent substance use. Depressive self-concept contributed to behavioral under-control among girls. A series of hierarchical regressions revealed that these relationships persist when controls for co-occurring forms of child abuse (physical, exposure to domestic violence) are included. Implications and limitations of the study as well as directions for future research are discussed.

CHAPTER 1: INTRODUCTION

Over the past three decades, researchers have identified a broad range of negative outcomes associated with child sexual abuse. Undesirable after-effects span the areas of physical, behavioral and psychological health. Among some of the most widely researched sequelae are depression (e.g., Lanktree, Briere, & Zaidi, 1991), posttraumatic stress (e.g., Briere & Runtz, 1993; McLeer, Deblinger, Atkins, Foa, & Ralphe, 1988), delinquency (e.g., Dembo, Williams, Schmeidler, et al., 1992; Herrera & McCloskey, 2001; Hoyt & Scherer, 1998), and health risk behavior (e.g., Dembo, Williams, Wothke, Schmeidler, & Brown, 1992; Felittiet al., 1998; Rotheram-Borus, Mahler, Koopman, & Langabeer, 1996). Many of these outcomes have severe consequences; depression can lead to suicidality and suicide attempts, delinquency can result in criminal prosecution and/or imprisonment, and health risk behaviors such as smoking, substance use, and engaging in unsafe sex can impair health and foreshorten life expectancy. A number of these outcomes also pose risks for later re-victimization. For example, sexual abuse among girls has been linked to subsequent drug use and alcohol abuse in adolescence and adulthood (Briere & Elliott, 1994). These behaviors have, in turn, been linked to risk for rape in adulthood (Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Warshaw, 1988) and the occurrence of physical violence in romantic partnerships (Kunitz, Levy, McCloskey, & Gabriel, 1998).

Estimates of the prevalence of child sexual abuse in the United States tend to converge around 20%-30% for girls and 5%-10% for boys (Finkelhor, 1994; Koss, Bailey, Herrera & Lichter, in press; Walker, Torkelson, Katon, & Koss, 1993). Estimates

of the rate of sexual abuse among males probably err on the low side because few quality studies have been done in this area (Finkelhor, 1994), and because there is at least some evidence that men underreport or fail to remember or disclose documented child sexual abuse more often than women (Widom & Morris, 1997). Nevertheless, a disturbing number of children suffer sexual abuse at some point during childhood, and are at increased risk for the undesirable outcomes outlined above. A clear understanding of the effects of sexual abuse and the mechanisms by which these effects evolve is necessary to guide efforts at treatment for those who have been victimized. The following work provides a summary of past research on the link between childhood sexual victimization and one type of health risk behavior, substance use (i.e., illicit drug use and alcohol abuse/dependence). Existing findings on potential mediators are discussed, and new findings on pathways from sexual victimization to substance use are presented.

<div align="center">Sexual abuse and substance use</div>

A large body of literature using diverse sampling techniques links childhood sexual abuse to substance use in later life. This section contains a review of existing findings, including, where available, information on age of onset and the observed effect size of childhood sexual victimization as a predictor of substance use.

Several researchers have linked sexual abuse and substance use among participants in clinical programs. In one study sampling 938 adolescents from residential drug treatment centers in the US and Canada, 64% of girls reported a history of childhood sexual abuse, as did 24% of boys (Hawke, Jainchill, & De Leon, 2000). In a study of adolescent psychiatric inpatients with a history of sexual abuse and matched, non-abused

inpatients, victims of sexual abuse were significantly more likely to report using a variety

of illicit drugs and alcohol (Singer, Petchers, & Hussey, 1989). Miller and colleagues

reported that sexual abuse was significantly more common among adult women

participants in Alcoholics Anonymous or outpatient alcohol treatment programs (67%)

than among comparison women drawn from the same community (28%; Miller, Downs,

Gondoli, & Keil, 1987). The sexual abuse reported by alcoholic women in the sample

was also of significantly longer duration than was that reported by comparison women.

Unfortunately, there are two important shortcomings to designs relying on help-

seeking samples. First, such samples are conditioned on the contingency (Dawes, 1993).

In other words, they have been selected because they exhibit the outcome behavior under

study. This practice has the side effect of artificially increasing the size of the observed

relationship between predictor and outcome. Studies using this approach can, therefore,

be criticized on the basis that they do not provide accurate estimates of effect size.

Second, the use of clinical samples raises the issue of generalizability: Sexual abuse

victims in clinical samples may be different from those who are not receiving treatment.

Studies based on more representative samples are, therefore, preferable, and

several researchers have used data from more normative populations to link childhood

sexual victimization with later substance use. Using a national household probability

sample of adolescents, Kilpatrick and colleagues found that sexual assault in the year

prior to the study increased the odds of adolescent alcohol abuse 2.4 times, marijuana use

1.56 times, and hard drug use 2.56 times after controlling for age, sex, ethnicity, familial

drug and alcohol problems, and physical assault (Kilpatrick et al., 2000). In a national

probability sample of adult women, rape before the age of 18 (i.e., forced or coerced vaginal or anal penetration) increased the odds of misuse of prescription medication by 3.67 times, lifetime use of marijuana by 3.09 times, lifetime use of hard drugs (cocaine, heroine, angel dust, etc.) by 3.51 times, lifetime alcohol abuse by 2.39 times, and lifetime substance abuse treatment participation by 5.15 times (Saunders, Kilpatrick, Hanson, Resnick, & Walker, 1999). Among over 42,000 students in grades 7 to 12, a history of sexual abuse predicted binge drinking for both boys and girls (Luster & Small, 1997). Using data from a community sample of Swedish women, Spak, Spak, and Allebeck (1998) found that sexual victimization before the age of 13 significantly increased the odds of lifetime alcohol dependence or abuse after controlling for familial alcohol problems, family dysfunction, psychopathology, and early deviant behavior. These data provide clear and convincing evidence of a relationship between childhood sexual victimization and heightened risk for substance use.

A number of studies suggest that not only are sexual abuse victims more likely to use drugs and alcohol, they also begin using substances at an earlier age, and report using a wider variety of drugs with greater frequency than non-abused controls. In one study, experiencing childhood sexual abuse was significantly correlated with adolescents' self reports of the number of different drugs that they had used ($r = .22$) and their early age of initiation for several substances: cigarettes $r = -.17$; alcohol $r = -.20$; illicit drugs $r = -.20$ (Hawke et al., 2000). Other authors found that sexual abuse was significantly related to frequency of drinking, frequency of drunkenness, frequency of drug use, and number of times "high on drugs" (Singer et al., 1989; p. 322). In the national survey by Saunders

and colleagues (1999) cited above, women reporting completed rape in childhood or adolescence also reported getting drunk for the first time and using LSD for the first time at an earlier age than comparison women.

Existing research reveals that the relationship between sexual abuse and substance use persists even when other potential contributors to substance use are included in analyses. Published findings suggest that sexual abuse contributes uniquely to the prediction of substance use when controlling for demographic variables (Kilpatrick et al, 2000), familial drug and alcohol abuse (Kilpatrick et al, 2000; Spak et al., 1998), and psychopathology (Singer et al., 1989; Spak et al., 1998). Dembo and colleagues present findings based on two samples of detained adolescent males showing that sexual victimization was predictive of marijuana/hashish use when physical abuse, family socio-economic status, parental presence, family alcohol/drug use/mental health problems, and family involvement in crime were included in statistical models (Dembo, Williams, Schmeidler, et al., 1992; Dembo, Williams, Wothke, et al., 1992). Standardized parameter estimates of the relationship between sexual victimization and marijuana/hashish use in these two studies ranged between .20 and .40, suggesting that the independent influence of sexual abuse is far from negligible, even in the presence of controls.

The majority of the studies cited so far, however, are retrospective and cross-sectional in nature. Thus, they are subject to measurement error with regard to childhood victimization due to problems with memory or normative memory degradation. Cross-

sectional studies also are of diminished utility in establishing causal links and determining causal order among related phenomena.

To summarize, the link between childhood sexual victimization and later substance use among girls and women has been replicated many times, although retrospectively. In addition, existing data suggest that this link persists when potentially confounding variables are considered. In fact, some authors have offered estimates of the proportion of substance abuse problems among women in the general population that may be related to sexual victimization. Cutler and Nolen-Hoeksema (1991) cite estimates of lifetime prevalence of drug and alcohol abuse among women at 4.4% each. Based on these estimates, on data suggesting that 20-30% of girls suffer sexual abuse, and on estimates of the effect size of sexual abuse on substance use, these authors suggest that 20 to 60% of cases of drug abuse and 32 to 91% of cases of alcohol abuse among women may be related to childhood sexual abuse. Unfortunately, these authors did not consider the potentially confounding effects of other forms of abuse in childhood that might co-occur with sexual abuse.

<div align="center">Potential pathways from sexual abuse to substance use</div>

We still do not know, however, why childhood sexual abuse is so strongly associated with substance use later in life, as few researchers have addressed this question. An examination of the literature on sexual abuse effects and risks for adolescent substance use yields several possible mediators. In a theoretical paper on the effects of sexual abuse, Finkelhor and Kendall-Tackett (1997) suggest that trauma and stress resulting from childhood sexual victimization can alter the normative course of

cognitive and social development for children. Their assertion converges with a wealth

of data tying sexual abuse to problems with fundamental developmental tasks such as the

formation of identity and self-concept (e.g., Briere & Elliott, 1994; Feiring, Taska, &

Lewis, 1996) and behavioral self-regulation (e.g., Brodsky et al., 2001; Herrera &

McCloskey, 2001; Katz, 2000). Other authors suggest that this alteration in normative

development may be seen in physiological and pubertal maturation as well (Trickett &

Putnam, 1993).

　　　The literature on substance use among adolescents points to problems with these

areas of development as potential risk factors. Specifically, several studies have linked

off-time, especially early, pubertal maturation with both early initiation and increased

levels of substance use (e.g., Lanza & Collins, 2002; Magnusson, Stattin, & Allen, 1985).

Negative self-concept, including low self-esteem, has also been proposed as an

etiological factor in adolescent substance use; it is thought that young people who have

not developed a positive sense of self-worth may "self medicate" in order to reduce or

escape negative feelings about themselves (Harter, 1999). Finally, behavioral under-

control, including risk-seeking, impulsivity, and aggression, has been associated

repeatedly with adolescent substance use (e.g., Hawkins, Catalano, & Miller, 1992;

Neumark-Sztainer, Story, French, & Resnick, 1997). The following sections outline

evidence supporting early pubertal timing, negative self-concept, and behavioral under-

control as potential pathways from childhood sexual abuse to adolescent substance use.

Specifically, data linking childhood sexual abuse with each of these constructs are

discussed, as are data linking early puberal timing, negative self-concept, and behavioral

under-control with substance use. Where possible, existing findings directly testing the

mediating roles of these constructs are presented.

Early pubertal timing

Several theorists suggest that sexual abuse may be related to pubertal timing

among girls. The direction of this relationship is uncertain, however, as is the question of

whether sexual abuse accelerates or delays physical maturation (Trickett & Putnam,

1993). In a review of the effects of sexual abuse on girls and women, Trickett and

Putnam note that repetitive stress such as that caused by sexual abuse can lead to

activation of the Hypothalamic/Pituitary/Adrenal axis and suppression of gonadal

hormones, possibly resulting in delayed puberty. Alternatively, they offer exposure to

male pheromones as a factor that may stimulate early development, while acknowledging

that empirical data addressing these hypotheses are almost non-existent.

In their presentation of an evolutionary theory of reproductive strategy

development, Belsky and colleagues suggest that socio-emotional stress during childhood

may accelerate puberty by increasing risk of depression and associated weight gain

among girls, which enables early sexual development (Belsky, Steinberg, & Draper,

1991). Although most existing studies have not examined the predicted role of weight

gain, empirical evidence tends to support the proposed link between childhood stress and

early menarche (but see Mezzich et al., 1997 for a counter-example). For instance, one

study of the relationship between divorce and pubertal timing found that girls in families

where there was divorce reached menarche 5 months earlier on average than girls from

intact families; parent report of marital conflict was also significantly related to girls' age

at menarche (Wierson & Long, 1993). In a longitudinal study based on data from a New Zealand birth cohort, family conflict measured in middle childhood was significantly negatively correlated with daughters' reports of age at menarche obtained when the girls were 15 (Moffitt, Caspi, Belsky, & Silva, 1992). Ellis and Garber (2000) found that dyadic stress and biological father absence mediated the effect of maternal mood disorder on daughters' pubertal timing. Parameter estimates of the effects of dyadic stress and biological father absence on daughters' pubertal timing, .33 and .26, respectively, were small to moderate. Although none of these studies address sexual abuse as a predictor, it is quite possible that stress associated with sexual abuse and its aftermath might function similarly to stress associated with divorce and interparental conflict in the acceleration of pubertal development. It is also plausible, however, that early maturing girls are targeted for sexual abuse because they appear more sexually mature than other girls. Thus, although theory and some evidence support this association, the exact nature of the relationship remains unclear.

Early puberty among girls is, in turn, linked to increased substance use and other problem behavior (Magnusson et al., 1985). Data from the National Longitudinal Study of Adolescent Health (Add Health) suggest that girls reporting early puberty were significantly less likely to report abstinence from substance use in 7th grade and were more likely to increase their substance use between the 7th and 8th grades than other girls. Early maturers were 3.3 times more likely to report using multiple substances in 7th grade, and 2 times more likely to report poly substance use in 8th grade when compared to on time- and late-maturers (Lanza & Collins, 2002). Although several different

researchers have replicated this relationship, the link does not appear to be straight

forward. For example, research based on a New Zealand birth cohort suggests that early

puberty is associated with increased problem behavior for girls in mixed-sex schools, but

not for those in single-sex schools (Caspi, 1995). Data collected from the same sample

also suggest that early puberty leads to increased problem behavior only for those girls

who exhibit problem behavior prior to puberty (Caspi & Moffitt, 1991).

Thus, existing research supports a link between pubertal timing and substance use

and other problem behavior. Although data linking child sexual abuse and early puberty

are sparse or indirect (i.e., related to "socioemotional stress" in general) and the direction

of association is uncertain, it is possible that pubertal timing may mediate the effects of

sexual abuse on substance use. Clearly, an investigation is warranted.

Depressive self-concept

A large body of theoretical and empirical work supports the notion that child

abuse in general and sexual abuse in particular are damaging to victims' identity

formation and positive sense of self (Briere & Elliott, 1994; Harter, 1999). In a review of

theoretical and clinical observation literature linking abuse and self-concept, Harter and

colleagues conclude that childhood abuse leads to feelings of inner "badness" among

victims (Harter, 1999; Harter, Bresnick, Bouchey, & Whitesell, 1997). They note

especially "the sense of profound negativity that female adolescent sexual abuse victims

experience with regard to their core self" (Harter et al., 1997, p.849). Damage to sexual

abuse victims' self-worth is thought to occur in two main ways: internalization of blame

and feelings of stigmatization. Westen (1994) suggests that self-blame for abuse among

children (especially younger ones) originates in two developmentally driven tendencies.

First, children tend to think in egocentric ways, and are unlikely to assign blame

externally. Second, because they are concerned with security, children are loathe to

assume that they are unable to protect themselves in a "malevolent world;" self-blame

allows them a sense of control over their bodies and environment and hope for expiation

of their "badness" through changes in their behavior. Finkelhor and Browne (1985)

propose that stigmatization is one of the main traumatogenic dynamics of sexual abuse.

These authors argue that feelings of stigmatization result from guilt, shame, and a sense

of isolation in terms of victim status that often accompany sexual abuse.

Empirical evidence tying childhood sexual abuse and poor self-concept is

accumulating (e.g., Kendall-Tackett et al., 1993; Stern, Lynch, Oates, O'Toole, &

Cooney, 1995). Using a sample of agency-identified maltreated children and non-

maltreated controls, Bolger, Patterson, & Kupersmidt (1998) found that sexual abuse

predicted both initial level of self-esteem ($r = -.19$) and rate of change in self-esteem over

time when other types of maltreatment were controlled. Gold (1986) found that adult

women from a community sample who were sexually abused during childhood or

adolescence reported significantly lower self-esteem than controls, and were more likely

to show stable, internal attributions for bad events and external attributions for good

events. In a quantitative literature review, or meta-analysis, Jumper (1995) found a

significant but small relationship between child sexual abuse and self-esteem among

women ($r = .24$).

Feiring and colleagues have conducted a series of studies further highlighting the roles of sexual abuse, shame, and self-blame in low self-esteem. They, like other authors cited above, argue that the impact of sexual abuse is mediated by victims' attributions about the event or events (especially with regard to blame) and resulting feelings of shame and stigma (Feiring et al., 1996). Empirical tests have supported their expectations. In one study based on data from an agency sample, self-blame and shame moderated the effects of sexual abuse on satisfaction with peer relationships (Feiring, Rosenthal, & Taska, 2000). The authors concluded that feelings of stigmatization were associated with problem relationships, which were related to negative self-concept. In a second study using data from a different agency sample, Feiring and colleagues (Feiring, Taska, & Lewis, 1999) found that children, as opposed to adolescents, and girls, as opposed to boys, had different reactions to childhood sexual abuse. Girls reported more shame than boys ($\underline{d}$ = about .4), and adolescents reported both more depressive symptoms ($\underline{d}$ = about .4) and lower self-worth ($\underline{d}$ = about .5) than children. Thus, existing evidence suggests that negative self-esteem may be a common problem among sexual abuse victims, especially among females, and especially during adolescence.

Negative feelings about the self have, in turn, been tied to substance use in adolescence and adulthood. From a theoretical standpoint, low self-esteem, depression, and hopelessness may result in attempts to dissociate from or escape the pain of low self-regard by engaging in self-destructive and escapist behaviors such as drug use (Harter, 1999). In other words, adolescents who feel badly about themselves may self-medicate in order to feel better, at least temporarily. The self-medication hypothesis is quite

common in substance abuse research (Gutierres & Todd, 1997), and is appealing in that it has a high degree of face validity.

Empirical data support the self-medication hypothesis as well. Data from the Christchurch Health and Development Study suggest that multi-problem (i.e., delinquent, substance using, etc.) youth were more often in the lowest decile of self-esteem and reported high rates of suicidal ideation (29.6%) compared to other youth (10.3%; Fergusson, Horwood, & Lynskey, 1994). Using data from a longitudinal sample of middle and high-school students, Jessor and colleagues found that self-esteem was predictive of engagement in multiple problem behaviors (problem drinking, marijuana use, delinquency, and early sexual initiation) after controls for demographics, expectations for success, peer variables, and grade point average were instituted (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). Data from the Minnesota Student Survey suggest that high self esteem is negatively correlated with suicide risk and substance abuse (r = -.49, r = -.26, respectively) among females (Neumark-Sztainer et al., 1997). Finally, in a review of literature on substance use, Gutierres & Todd (1997) concluded that existing research consistently suggests that drug users as a group have lower self-esteem than non-users.

A small body of research provides some support for the notion that low self-worth may mediate the effects of sexual abuse on later substance use. Dembo and colleagues have conducted a series of studies examining the mediating role of "self-derogation" (i.e., low global self-esteem) between physical and sexual victimization in childhood and later substance use. Using data from 145 detainees in a juvenile detention center, they found

that both sexual and physical abuse were related to drug use and that self-derogation

partially mediated the effects of physical but not sexual abuse on substance use (Dembo

et al., 1987). In a second study aimed at replicating and extending their previous

findings, Dembo et al. (1989) found that self-derogation mediated the effects of both

physical and sexual abuse on substance use; both types of abuse continued to have direct

effects on substance use as well. As the samples used in both these studies were drawn

from the same population, the authors conducted a multi-group analysis to test for model

equivalence across samples. The model in which self-derogation mediated the effects of

both physical and sexual abuse showed good fit when evaluated against two samples,

suggesting that self-derogation may play a role in the aftermath of both types of abuse.

Several issues, however, point to a need to replicate and extend these studies.

First, the study populations were incarcerated. For girls especially, this makes them

different from the majority of adolescents; an extremely dysfunctional home life is often

necessary to provoke girls into serious delinquency (Katz, 2000). Second, sexual abuse

was measured dichotomously, and previous research suggests that severity is an

important factor in predicting effects (Koss et al., in press). Sexual abuse reports were

also retrospective and relied on a single reporter. Third, the authors did not look at

possible confounds or other contributing factors, such as parental substance use, marital

violence, etc.

Finally, theory and some empirical evidence suggest that global self-esteem

scores do not fully capture a complex construct like self-worth. Harter and her colleagues

(Harter, 1999; Harter & Marold 1994) point out the substantial correlations that exist

between low global self-esteem, depression, and hopelessness, arguing that they are so closely related as to be indicators of a more general "depression/adjustment composite." Based on a series of studies in which she attempted to sort out the causal order of the components of depression/adjustment, Harter (1999) concludes that causal order varies among individuals. For example, low self-esteem may precede depression among some people, whereas the direction of effect may be reversed for others. In light of this, she recommends grouping these three variables to create a depression/adjustment composite, and has found empirical support for such a construct (Harter & Marold, 1994).

Other support for the notion of a depression/adjustment composite can be gleaned from the literature on sexual abuse. Low self-esteem, depression, and hopelessness – usually in the form of suicidality – have high rates of comorbidity among sexual abuse victims (Briere & Elliott, 1994; Koss et al., in press). Further, the links between childhood sexual victimization and later depression and hopelessness have been well established by past research (for reviews see Briere & Elliott, 1994; Kendall-Tackett et al., 1993; Koss et al., in press). Thus, the depression/adjustment composite may be a useful heuristic in sexual abuse research, and will be used in slightly modified form in the present paper.

Behavioral under-control

Most research on the effects of sexual abuse has tended to focus on depression and posttraumatic stress, likely because these are the most commonly observed outcomes (Koss et al., in press). This focus on internalizing symptomatology, however, may limit our understanding of the impact of sexual abuse. The fact that sexual abuse is associated

with several types of adolescent problem behavior, including sexual risk-taking (Briere & Runtz, 1993), delinquency (Katz, 2000), and substance use (see above) suggests that investigations into behavioral self-regulation in the aftermath of sexual victimization may be fruitful.

Behavioral under-control, or disinhibition, has been investigated recently as a catalyst in the adolescent risk-behavior literature. Behavioral under-control typically includes sensation- or risk-seeking, aggression, impulsivity, hyperactivity, and inattention (e.g., Colder & Stice, 1998; Dawes, Tarter, & Kirsci, 1997; see below for more discussion). The literature on sexual abuse reveals some support for this constellation of behaviors among victims as well. For example, in one sample of substance abusing adolescent girls, a composite measure of physical and sexual victimization in childhood was correlated significantly with a behavioral under-control factor incorporating measures of hyperactivity, impulsivity, and inattention (Mezzich et al., 1997). Wonderlich et al. (2001), using data from 20 sexual abuse victims in treatment and 20 matched controls, found that sexual abuse was related to self-reported impulsivity (R^2 = .15). Data from a sample of adult inpatients indicated that a history of physical or sexual child abuse was associated significantly with higher levels of self-reported impulsivity ($\underline{d}$ = about .5) and aggression ($\underline{d}$ = about .5; Brodsky et al., 2001). Thus, in addition to being anxious and depressed, victims of sexual abuse also may exhibit problems with disinhibition.

Several authors of research on substance use have found support for a latent construct incorporating impulsivity, hyperactivity, risk-seeking, and aggression, and have

reported data linking this construct to substance use. Giancola and Parker (2001) note that difficult temperament (hyperactivity, fussiness, irritability, distractability, etc.) is a risk factor for substance use commonly identified in the literature, as is antisocial behavior including aggression. Using data from their own longitudinal study of boys with and without a family history of substance use, these authors found that difficult temperament at age 10-12 was predictive of substance use at age 16; aggression at age 12-14 mediated this relationship. In another study, low behavioral self-regulation factor scores were associated with deviant peer affiliation, poor school performance, and family dysfunction among boys, all of which predict adolescent substance use (Dawes et al., 1997).

Although most existing research seems to have focused on boys, data suggest that the relationship between behavioral dysregulation and substance use holds for girls as well (see Tiet, Wasserman, Loeber, McReynolds, & Miller, 2001 for a counter-example). Data from the Minnesota Twin Family Study revealed that girls and boys who reported drinking before age 14 scored .20 - .50 standard deviations above nondrinkers on age 11 teacher-rated measures of opposition, hyperactivity, impulsivity, and inattention; early alcohol use initiation is a risk factor for later alcohol dependence (McGue, Iacono, Legrand, Malone, & Elkins, 2001). Giancola, Mezzich, & Tarter (1998), using data from an agency sample of adolescent girls, found that those with a substance use disorder exhibited significantly more aggressive, disruptive, and delinquent behavior than comparison girls when controlling for age and socio-economic status. Findings from another sample of alcohol-abusing/dependent and comparison adolescents revealed

significantly higher levels of self-reported impulsivity and aggression among both male and female problem drinkers (Solof, Lunch, & Moss, 2000). Colder & Stice (1997) focused on impulsivity as a key indicator of disinhibition in their 9-month longitudinal study of high school seniors, and found that it predicted substance use both concurrently and prospectively when controlling for initial levels of use. Finally, data from the Minnesota Student Survey revealed that risk-taking disposition predicted drug use among 6th, 9th, and 12th grade girls (Neumark-Sztainer et al., 1997).

Some authors have proposed physiological mechanisms to account for the link between aspects of behavioral self-regulation. Brodsky et al. (2001) review evidence indicating that low serotonin may reflect a common biological substrate for aggression and impulsivity. They suggest that childhood abuse may affect this substrate. In their study, not only did victims of child physical and/or sexual abuse report more aggression and impulsivity, they were also significantly more likely to report attempting suicide (46%) than controls (21%). Low levels of serotonin in the brain are also linked with depression (Schatzberg, 2002). Thus, depression, aggression, and impulsivity may all share a common neuro-chemical substrate, and among some survivors of sexual abuse, the ill effects of victimization may be expressed in all of these domains. Since depression, aggression, and impulsivity are all heritable, behavior genetic explanations of these relationships are also possible. Unfortunately, it was impossible to evaluate support for a behavior genetic perspective in the present study. This potential alternative explanation is explored more in the Discussion.

Data from several sources support the notion that sexual abuse may negatively affect symptoms related to low serotonin. As noted above, Mezzich et al. (1997) found that physical and/or sexual victimization in childhood was correlated with behavioral dysregulation in adolescence. In addition to this, analyses revealed that internalizing disorders (depression and anxiety) mediated the relationship between behavioral dysregulation and substance use and between victimization and substance use. When externalizing behavior was added to the model, findings suggested that behavioral dysregulation and victimization were linked to internalizing disorders, which were linked to externalizing disorders, which were linked in turn to substance use. Among boys, internalizing problems often co-occur with delinquency, aggression, and substance use (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998; Loeber, Stouthamer-Loeber, & White, 1999).

Based on findings summarized in this section, sexual abuse is associated with several victim characteristics that may be indicative of behavioral under-control. Low behavioral self-control, in turn has been linked repeatedly to adolescent substance use. It seems likely, then, that low behavioral self-control may represent a pathway from sexual abuse to later substance use. Furthermore, emerging lines of research suggest that a common biological mechanism may contribute to both externalizing and internalizing disorders among sexual abuse victims. Therefore, it also is possible that these two types of disorder may work together in determining risk for substance use.

Mother-daughter transmission of risk

Perhaps the most powerful predictor of adolescent drug and alcohol use identified

in the literature is parental substance use. Researchers have identified two main

pathways of influence in this relationship, and both have been well supported. The first

mode of transmission is genetic. Hawkins et al. (1992) review several studies

demonstrating high concordance rates of alcoholism among monozygotic twins, as well

as differences between children of alcoholics and controls in neurochemical and brain

wave responses to alcohol. Data from the Minnesota Twin Family Study suggest that

early initiation of alcohol use by mothers (but not fathers) was associated with early

initiation of alcohol use by offspring of both sexes (McGue, Iacono, Legrand, & Elkins,

2001). Transmission of early alcohol use onset was targeted by the authors, because

onset of alcohol use before the age of 15 poses a risk for later abuse and addiction among

both males and females (McGue, Iacono, Legrand, & Elkins, 2001). In the Minnesota

Twin Family Study, early alcohol use was only slightly heritable for girls (heritability

coefficient $\underline{h} = .11$) and showed a much stronger genetic link for boys ($\underline{h} = .55$). The

finding that genetic influences on drinking are smaller among girls is consistent with the

preponderance of existing literature (Hawkins et al., 1992).

The ascendant model to explain girls' substance use is an environmental one, and

connects to Social Learning Theory and problem parenting. In a cross-sectional, three-

generation study of substance use and parenting among students in Los Angeles County,

analyses revealed that drug use among grandmothers was associated with drug use among

their daughters (Stein, Newcomb, & Bentler, 1993). Drug problems among these

daughters, in turn, were related to developmental and behavior problems among both male and female grandchildren, and males fared notably worse. Although they did not examine specific mechanisms of transmission, these authors suggest problem parenting and social learning, especially with regard to self-medication for emotional distress, as likely candidates. In their review of literature on the etiology of adolescent substance use, Hawkins and colleagues (1992) conclude that parental substance use behavior and attitudes provide models for adolescents, and also lead to conflict and decreased warmth in families. These factors, in turn, predict adolescent drug and alcohol use (Hawkins et al., 1992).

In addition to predicting adolescent substance use, however, elevated parental drug and alcohol use and increased conflict have been identified as risks for childhood sexual abuse (Finkelhor & Baron, 1986). It is possible that the impact of childhood sexual abuse on substance use can be explained by looking at family contexts that may contribute to both of these variables.

The intergenerational transmission of risk and victimization from mothers to daughters within families is an aspect of family context that has received little attention. Some evidence does exist, however, to suggest that such transmission occurs. In a case study of a family in New York City, researchers found that family norms regarding the acceptance of substance use and physical and sexual violence from intimates were passed from mother to daughter across 4 generations (Dunlap, Golub, Johnson, and Wesley, 2002). Consequences of these norms observed in each generation included early pregnancy, violence in dating/marriage relationships, and substance abuse. McCloskey

and Bailey (2000) found that maternal history of sexual abuse increased the risk of sexual abuse among daughters (odds ratio 3.6). This risk was especially pronounced when mothers reported drug use in conjunction with a history of childhood sexual victimization (odds ratio 23.7).

In fact, daughters of women who were sexually abused in childhood face a wide range of risks. These women are more likely to use substances (e.g., Saunders et al., 1999) and are at increased risk of being battered (e.g., Fleming, Mullen, Sibthorpe, & Bammer, 1999; Kunitz et al., 1998). Parental substance use (e.g., Famularo, Kinscherff, & Fenton, 1992) and domestic violence (e.g., Rumm, Cummings, Krauss, Bell, & Rivara, 2000) put girls at heightened risk for physical abuse. In short, there appears to be a complex relationship between daughters' victimization and substance use and family contexts relating to co-occurring forms of abuse and maternal victimization history and substance use behavior. It is possible that the link between childhood sexual abuse and substance use observed in the literature may be explained by these factors.

As noted above, research on the mother-daughter transmission of risk for victimization is sparse, especially with regard to sexual victimization. Concordance between mother and daughter trajectories has been demonstrated in other areas, however. For example, early childbearing among women is predictive of early childbearing among their daughters (Hardy, Aston, Brooks-Gunn, Shapiro, & Miller, 1998). Similar patterns of delinquency and arrest have also been identified among mother-daughter pairs (Farrington, Barnes, & Lambert, 1996; Rowe & Farrington, 1997). Finally, some researchers have found evidence that patterns of health risk behavior (i.e., smoking, lack

of exercise) are passed from parents to children along gender lines, with daughters'

behavior reflecting that of their mother and boys' that of their father (Wickrama, Conger,

Wallace, & Elder, 1999). More research is necessary in order to highlight patterns of

intergenerational transmission of risk and to identify potential mechanisms for this

transmission.

<u>Aims and hypotheses</u>

With the above discussion in mind, the present study aims to compliment and

extend past research in three ways. The first goal is to replicate the link between

childhood sexual abuse and substance use using a semi-prospective, longitudinal design

and instituting controls for potentially confounding variables. These two design elements

represent important improvements with regard to most existing research on sexual abuse,

which has relied heavily on retrospective designs using adult samples and has often

ignored the likely effects of co-occurring forms of abuse. The second goal is to explore a

possible intergenerational parallel between the sexual victimization of women and their

daughters. This study will attempt to elucidate some of the similarities between sexual

abuse and its consequences for mothers and their daughters. The final goal of the present

study is to identify some of the mechanisms by which sexual abuse may lead to substance

use. Specifically, the mediational roles of early pubertal timing, depressive self-concept,

and behavioral under-control will be tested. The resulting information will, hopefully,

contribute to the design of more effective and efficient treatment strategies for sexual

abuse victims.

A series of three research questions are posed in an attempt to achieve these goals. The questions are listed below, followed by specific hypotheses associated with each question.

- Question 1: Is the link between childhood sexual abuse and later substance use explained by other, co-occurring forms of abuse?

    - Associated hypothesis: childhood sexual abuse will predict drug and alcohol use in adolescence when witnessing marital violence and physical child abuse are controlled statistically.

- Question 2: Is the link between childhood sexual abuse and later substance use explained by mother-daughter transmission of risk?

    - Associated hypotheses: 1) mothers' sexual abuse history will increase daughter's risk of sexual abuse; 2) mothers' sexual abuse history will be associated with increased maternal substance use; 3) mothers' substance use will increase daughter's risk of sexual abuse; 4) mothers' substance use will be predictive of daughters' substance use; 5) daughters' sexual abuse will heighten their substance use, even when maternal history and behavior are considered.

- Question 3: What are some pathways from sexual abuse to substance use for girls?

    - Associated hypotheses: 1) maternal substance use and daughter's sexual abuse will contribute to daughter's substance use as in Question 1; 2) early pubertal timing, 3) depression/adjustment, and 4) behavioral self-regulation will emerge as mediators of the relationship between childhood sexual abuse and adolescent

substance use; 5) depression/adjustment and behavioral self-regulation will be interrelated as predictors of substance use.

CHAPTER 2: METHOD

Participants

Participants include 150 girls drawn from a larger longitudinal study of the effects

of domestic violence on women and children. The overarching study began in 1990-91,

and has consisted of three waves of in-person data collection; both mothers and children

were interviewed in 1990-91 (Wave 1), 1996-97 (Wave 2), and 1998-99 (Wave 3).

Families were recruited either from battered women's shelters or from the general

community. Women recruited from the community responded to one of two sets of fliers

posted sequentially in public locations in a mid-sized Southwestern city. The first set of

fliers requested the participation of women who had experienced violence from a male

romantic partner within the past year and who had children between the ages of 6 and 12

years. The second set of fliers, posted in the same locations as and upon removal of the

first set, requested the participation of women with children aged 6 to 12 years in a

"study of the family", and made no mention of intimate violence. The purpose of this

second set of fliers was to recruit a comparison sample of women who had not recently

been in violent relationships. After initial screening, it was discovered that 29 of the

women responding to the second set of fliers had experienced substantial partner violence

in the preceding year, and these women were reclassified as "battered." The total sample

consisted of 363 mother/child pairs, including 193 families of battered women (60 from

shelters, 133 from the community) and 170 comparison families.

The ethnic breakdown of the subsample used in the present study reflects that of

the mid-sized Southwest city from which it was collected; 54% of the participants self-

identified as Anglo-European, 36% as Hispanic, 5% as African-American, 3% as Native-American, and 1% as Asian/Pacific Islander. One percent self-identified as "other" or "mixed." Girls averaged 9.2 years of age at Wave 1, 14.6 years of age at Wave 2, and 16.4 years of age at Wave 3. Retention across waves has been good, with participation rates of 83% and 87% at Waves 2 and 3, respectively. Families were less likely to continue participation in the study at Wave 3 if they were originally recruited from battered women's shelters or they had many family stressors at the outset of the study (odds ratio .63 and odds ratio .86, respectively). There were no other differences between those retained and those who ended participation on number of other variables, including maternal marital status, education, employment, mental health, and family income.

Procedure

Mothers and children participated in separate, face-to-face interviews at each wave. The interview protocols at each wave included questions on a wide range of topics relating to family functioning. The interviews at Waves 1 and 2 focused on the assessment of marital violence and conflict, childhood physical and sexual abuse (of both mothers and children), and maternal and child mental health. Wave 3 interviews focused on marital satisfaction, maternal family of origin, maternal and child mental health, and child outcomes including school performance, substance use, delinquency, and relationship violence. The majority of information was obtained orally, however, Waves 2 and 3 also included several written measures. Interviews typically lasted between 1 and 3 hours. The progression over time from risk factor assessment to outcome assessment

allows for the testing of mediational models that take advantage of the longitudinal structure of the available data.

Interviewers underwent an intensive training program of approximately 30-40 hours, to enable them not only to collect reliable and complete data, but also to allow them to deal effectively with sensitive topic areas. Participants were compensated for their time ($50 per family), and were advised of their rights to voluntary participation and to confidentiality; the limits to confidentiality in the case of child abuse especially were clearly explained. The legal and ethical guidelines regarding disclosure of sexual abuse were followed (c.f., Urquiza, 1991). Because of the full disclosure of the potential consequences of revealing child abuse, it is possible that current findings underestimate the rate of sexual abuse in the sample.

<div align="center">Measures</div>

Child sexual abuse

For the purposes of this paper, the following definition of child sexual abuse is used. Sexual abuse includes: noncontact incidents such as modeling of inappropriate sexual behavior, forced involvement in exhibitionism, and contact incidents ranging from fondling to penetration occurring at or before the age of 14 and perpetrated by an individual 5 or more years older than the victim. Incidents involving perpetrators closer in age to the victim are considered sexually abusive if force or violence is used. This definition allows for the conceptualization of degree of contact as a continuous construct, ranging from no contact to extensive contact. It also focuses on a conservative definition of child sexual abuse by including mostly pre-pubertal girls. Finally, it allows for the

exclusion of what may be interpreted as normative sexual exploration between age-mates (see Peters, Wyatt, & Finkelhor, 1986).

To assess child sexual abuse, mothers and children were asked open-ended questions about the child's sexual victimization during interview Waves 1 and 2 (see Appendix A). Positive reports to any of the questions were probed to obtain detailed narratives of the children's abuse experiences. It is from these narratives that information useful in creating the sexual abuse index score was obtained. Mothers' reports of abuse pertaining to children other than the target child were not considered in the present study.

Creating a severity index.   The sexual abuse variable used in the present analyses is an index variable that captures information about the severity of abuse experiences. This strategy was adopted because sexual abuse severity is, conceptually, an emergent construct (i.e., the opposite of a latent construct). That is, aspects of the abuse experience combine to determine the severity of a particular incident, which is arguably indicative of the amount of trauma that it will produce. This approach is somewhat different from that taken in existing literature, where variables like perpetrator/victim relationship and degree of contact, when they are examined, are considered to be moderators of the effects of a dichotomous sexual abuse variable. Formulating sexual abuse severity as an emergent variable eliminates the need for a dichotomous abuse status variable, which is rife with measurement error, by permitting the conceptualization of abuse severity as a continuous construct. Unfortunately, the structural equations modeling software used in the present study (see below) is unable to model emergent constructs. Therefore, abuse characteristics were summed to

approximate an emergent abuse severity variable.

Scores were created by summing the number of different perpetrators (sample range 0-6) with codes for perpetrator/victim relationship and degree of contact for each child; variables were standardized before being summed. Perpetrator/victim relationship was coded as follows: 0 – no abuse; 1 – stranger; 2 – acquaintance; 3 – extended family member; 4 – nuclear family member, with the perpetrator most closely related selected for coding when more than one was identified. This scoring scheme, which places greater weight on incidents involving more closely related perpetrators, is supported by research on adult women suggesting that sexual assault has a greater impact when carried out by known assailants (Culbertson & Dehle, 2001). Degree of contact was coded as follows: 0 – no abuse; 1 – non-contact abuse; 2 – contact abuse not involving physical violence; 3 – contact abuse involving physical violence; 4 – penetration. "Penetration involving physical violence" was not created as a category, because it was felt that penetration during child sexual abuse is inherently violent. Again, existing research showing more detrimental outcomes associated with penetration as compared to less extensive sexual abuse supports this coding scheme (e.g., Johnson, Pike, & Chard, 2001).

If a child was victimized on several occasions, the highest degree of contact was selected for coding. For example, a child who had been penetrated by an older cousin and "flashed" by a stranger would receive the following scores: number of perpetrators = 2; (closest) perpetrator relationship = 3; (highest) degree of contact = 4; severity score = 9. Any disagreement between reports of the same incident was resolved by coding the more severe report. For instance, if, at Wave 1, this same child reported that her cousin

penetrated her, but, at Wave 2, reported that he fondled her, the incident was coded as involving penetration. Finally, if this child's mother reported that the child had been fondled by her cousin, but the child reported penetration, the incident was coded as involving penetration.

The most severe aspects of girls' abuse experiences are indexed in this way, rather than scoring all abuse incidents, for two reasons. First, this strategy eliminates the possibility that the same incident would be scored more than once mistakenly. Second, a small number of the girls had experienced extensive abuse at the hands of multiple perpetrators, and scoring each incident, as opposed to only the worst aspects of their abuse history, would have created statistical outliers. For example, one girl reported being gang raped by 4 men, as well as sexually abused by other perpetrators. Her victimization history was among the most extensive in the sample, and coding all of her experiences would have resulted in a highly elevated score. Participants who were not abused received a score of zero for each severity variable; higher scores indicated more severe abuse.

Reporting accuracy and reliability. The question of whether children can provide accurate accounts of sexual abuse is a sensitive one, about which there has been much debate in the literature. Despite empirical evidence suggesting that children rarely fabricate sexual abuse incidents (Finkelhor, 1994), some researchers and members of the legal and lay communities remain skeptical of sexual abuse reports. In an attempt to address this concern, transcripts of all positive reports of sexual abuse were evaluated using a coding system developed in consultation with an attorney. Therefore, the criteria

used to identify sexually abused children in this sample were similar to legal guidelines,

and included the clarity and consistency of detail provided about various aspects of the

incident(s), such as the identity of the abuser, specific acts involved in the abuse, the time

and place of the abuse, and the results of any report made of the abuse (i.e., to the child's

parents, Child Protective Services, the police, etc.). For example, a report made by a

child who stated that her father raped her from age 2 to 6 and that he is in prison for life

for molesting her and other children was included as a case of sexual abuse. A report

made by a mother who stated that she suspected that her children had been abused

because she associated with drug users, but who was unable to provide any concrete

evidence, was excluded. In fact, a large number of maternal reports were excluded at

Wave 2 because mothers reported suspicions that their daughters may have been abused,

but were not sure and were unable to provide details in support of their suspicions. Any

report detailing what could be interpreted as mutual or consensual sexual exploration

between close age mates or consensual sex with a partner 5+ years older[1] was also

excluded. Children were considered "sexually abused" if either the mother or the child

provided a detailed, internally consistent report of sexual abuse. It was not a requirement

that both reporters reply affirmatively to the abuse questions, nor was it expected that

mother and daughter reports would necessarily refer to the same incident, although a

large portion of them did (see Descriptive Statistics below). Table 1 displays the total

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1. Several of the adolescent girls had had sex with boyfriends 5+ years older than them, which their mothers reported as "inappropriate sexual contact with someone 5 or more years older". As these incidents seemed to be cases of consensual sex between dating partners, they were not considered sexually abusive.

number of reports by either mothers or daughters, the total number of included cases of

sexual abuse, and the reasons that some cases were excluded.

Table 1.

Reasons for exclusion of sexual abuse reports by Wave and reporter.

Reason for exclusion	Wave 1 Reports		Wave 2 Reports	
	Children	Mothers	Children	Mothers
Sexual contact between age-mates	2	8	8	6
Consensual sex w/ older partner	0	0	1	3
Sexual harassment	1	1	2	1
Insufficient detail and/or inconsistency	6	4	0	15
Included reports	24	29	28	21
Total Number of Reports	33	42	39	46

When mothers or children reported either physical or sexual child abuse, project

staff followed up with participants to determine whether Child Protective Services (CPS)

had been notified. This was accomplished with staff making a call to caseworkers at CPS

to confirm a report in the agency's computer database. If a report existed, no further

report was filed. If not, staff offered to assist mothers in reporting the abuse, and 4 such

reports were made with mothers' cooperation. In one case, a CPS report was filed in

spite of a mother's wishes to the contrary, as the child reported extensive, ongoing sexual abuse. Project staff kept detailed records about their contacts with CPS, including dates of new and existing reports, the nature of the problem(s) reported, etc. Based on these records, it was determined that 80% of the families reporting sexual abuse of the target child at Wave 1 had been involved with CPS, either as a result of previous reports or of reports made with the help of the project. Agency involvement, however, was not used as a criterion in sexual abuse determinations as official reports may be biased in terms of ethnicity and socio-economic status. In addition, some cases of past sexual abuse would be omitted if only within-state records were used. Finally, not all CPS-related records referred to the same incident of child sexual abuse as described in the narratives.

The author was involved in rating both the Wave 1 and Wave 2 reports. Twenty of the Wave 1 reports were double-rated, once by the attorney and once by the author. Agreement on whether abuse had occurred and was reported with clear and consistent detail was 95%, kappa = .61. The remaining Wave 1 reports were coded by the attorney. Twenty of the Wave 2 reports were double-coded, once by an undergraduate research assistant and once by the author. Agreement on whether abuse had occurred was 100%. The remaining Wave 2 reports were coded by the research assistant or by the author. See Table 2 for descriptive findings about the sexual abuse experiences of girls in the sample.

Table 2.

Summary of descriptive information about girls' sexual abuse experiences, W1 and W2 combined (n = 43).

Identity of perpetrator	Nuclear family	29%
	Extended family	18%
	Acquaintance	49%
	Stranger	4%
Severity of abuse	Non-contact	7%
	Contact w/o Violence	37%
	Contact w/ Violence	15%
	Penetration	42%
Consequences to perpetrator	None	24%
	Personal	14%
	Legal/police	40%
	Court/jail	22%
Number of perpetrators	1	60%
	2	30%
	3	9%
	4+	1%

Maternal sexual abuse

Mothers were also asked about their own sexual abuse histories. At Wave 1, they were asked whether anyone had tried to touch them in a sexual way and whether anyone

tried to have intercourse with them during childhood. Responses to these two questions were given on a 5 point Likert-type scale (0 – never, 1 – once, 2 – twice, 3 – three times, 4 – often/many times). In the case of affirmative responses, information about the identity of the perpetrator was gathered. At Wave 2, mothers were asked to respond to the statement "someone molested me in my family [of origin]" before the age of 11. Possible answers ranged from 1 "never true" to 5 "very often true." Positive responses (i.e., 2 or higher) were probed to obtain information about the perpetrator and the victim's age at the time of abuse. Information about non-contact abuse was not collected; all women reporting "molestation" were considered to be victims of contact sexual abuse. Women were also asked about their sexual assault history at Wave 2 using the question "have you ever had sexual intercourse when you didn't want to because a man threatened or used some degree of physical force to make you?" Probes in the case of positive responses included questions about the identity of the assailant, the number of different assailants, consequences to the assailant, and woman's age at the time of the assault. Assaults occurring at age 14 or earlier were included in sexual abuse coding. As this question asked about completed rape, all cases identified in this way were considered victims of sexual abuse involving penetration.

Information on the degree of contact (0 – no abuse; 2 – contact abuse; 4 – penetration), the mother's relationship to the perpetrator (0 – no abuse; 2 - acquaintance; 3 - extended family; 4 – nuclear family), and the frequency of the abuse (0 – never to 4 – very often) was culled from questions asked at both waves. Using these data, a severity score analogous to that used for girls was constructed by summing the three values listed

above. As with the girls' sexual abuse severity score, the most extensive incident and most closely related perpetrator were scored when multiple victimizations were reported. For example, a woman who reported being raped in childhood by a brother and molested "very often" by a cousin would receive the following scores: (highest) degree of contact = 4, (closest) perpetrator relationship = 4, frequency of abuse = 4, severity score = 12. Details about mothers' sexual abuse experiences are presented in Table 3.

Table 3.

Summary of descriptive information about mothers' sexual abuse experiences, W1 and W2 combined (n = 80).

Identity of perpetrator	Nuclear family	33%
	Extended family	40%
	Acquaintance	29%
Severity of abuse	Contact	43%
	Penetration	57%
Frequency	Rarely	24%
	Sometimes	13%
	Often	10%
	Very often	58%

Exposure to marital violence

The exposure to marital violence variable used in the present study reflects the duration in years of girls' lifetime exposure to their mother's violent partner(s). Duration of exposure, as opposed to the severity of violence reported by mothers or the number of

violent men in the mothers' lives, was selected because it is correlated with both of these other variables (range r = .53 to .64) but has more variance and less negative skew.

Computation of the number of years during which girls were exposed to a violent man living in the home was based on the synthesis of data on marital violence gathered from mothers at Waves 1 and 2. First, it was determined whether women's current partners at the outset of the study (Wave 1) were violent. Then, at Wave 2, women were asked about their experience with any other violent, live-in partners. Information about the beginning and ending dates of each relationship was collected. Then, for women who were in a violent relationship at any time, data about the dates of each relevant relationship were used to determine the duration of the relationship in years. Finally, the durations of individual violent relationships were summed, giving a total number of years during which each woman lived with a violent man. Violent relationships ending before the girls were born were excluded, and those beginning before the target child's birth but continuing after were truncated based on the child's date of birth. Families in which there had not been violence during the daughter's lifetime received a score of 0.

At Wave 1, items used in detecting marital violence were drawn from the Conflict Tactics Scale (CTS; Straus, 1979), supplemented by items original to the overarching study. "Marital violence" was operationalized as a partner having slapped the mother more than two times and/or having done any of the following to her: kicked/hit her, hit her with an object, beaten her for minutes, choked her, threatened her with a weapon, used a knife or gun, threatened to kill her if she left, burned her, hurt her badly enough that she thought she should seek medical attention.

At Wave 2, women responded to a subset of the partner violence questions asked at Wave 1. Marital violence at Wave 2 was operationalized as a partner having slapped the mother more than two times and/or done any of the following: kicked/punched her, choked her, threatened her with a weapon, struck her with hands or feet, struck her with an object, threatened to use physical force against her, given her cuts/bruises, given her injuries that needed medical attention, made her think of calling the police. To capture information about partners with whom the women lived in between Waves 1 and 2, they were asked (at Wave 2): "During [target child's] life how many different live-in relationships have you had, outside of –not including- your present one?" If the mothers reported that these live-in partners ever threatened to seriously harm them or physically hurt them, the relationships were considered violent, and information about dates of the relationship and specific acts of violence was collected.

To sum up the scoring procedure, each relationship that a woman reported during and between Waves 1 and 2 was evaluated for the presence of violence based on the questions outlined above. For each woman who experienced violence, the duration in years of all her violent relationships were added together and then adjusted according to her daughter's date of birth. The resulting variable is continuous, and represents each girl's exposure to marital violence in number of years. Girls who were never exposed to marital violence received a score of 0 years.

Physical child abuse

At Wave 1, mothers and children responded to a series of questions tapping escalated violence directed toward the child by either parent. Mothers reported whether

their partner(s): kicked/punched the child, beat the child until there were bruises, burned/scalded the child, threatened the child with a knife or gun, injured the target child so that she needed to seek medical attention. Children were asked whether they had been kicked/punched or burned by their mother or her partner(s). If either mother or child responded positively to any one of these questions, the child was classified as physically abused. Therefore, the physical child abuse variable used in the present analyses is dichotomous (0 – not abused; 1 – abused).

Pubertal timing

Pubertal status was assessed at Wave 2 using a series of questions about perceived pubertal timing taken from the Michigan Study of Adolescent Life Transitions (Fuligni, Eccles, Barber, & Clements, 2001). Respondents reported on the timing of their body hair growth, skin changes, body changes, and breast development using the following scale: 1 – "before most others"; 2 – "same time as others"; 3 – "after most others". Respondents who reported no such changes received scores of 0 on these items. Timing items were recoded so that higher scores reflect earlier pubertal timing. Girls were also asked to report the age at which they began menstruating. Two methods were used to impute age at menarche for girls missing this information (n = 24, sample mean = 12 years). Those girls 12 years old or younger who had not begun menstruating were assigned the sample mean. Those girls older than 12 who had not begun menstruating were assigned their current age at Wave 2.

Self-esteem

Adolescent global self-esteem was measured at Wave2 using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). This is a widely used, 10 item instrument demonstrating good internal consistency (α = .87 in the present sample). Items were averaged to obtain a mean scale score.

Depression

The Center for Epidemiological Studies Depression scale (CES-D; Radloff, 1977) was administered to participants at Wave 2. This scale contains 20 items, and has been used in numerous studies. Internal consistency in the present sample was good (α = .76). Items were averaged to obtain a mean scale score.

Suicidality

Participants responded to a series of 4 questions tapping suicidal ideation at Wave 2. The questions were administered in a manner consistent with questions from the CES-D, incorporating the same one-week timeframe and response scale (1 – rarely or none of the time, 2 – some or a little of the time, 3 – occasionally or a moderate about of time, 4 – most or all of the time). Specific questions were: "I thought about killing myself", "I felt that I would kill myself if I knew a way", "I felt that my family and friends would be better off if I was dead", and "I had thoughts about death" (α = .77). Scores reflect the mean of the 4 items.

Behavioral under-control

The Aggression and Attention Problem subscales of the Child Behavior Checklist (CBC; Achenbach & Edelbrock, 1983) were administered to adolescents at Wave 2. The

CBC is a widely used, well-validated measure of child and adolescent problem behavior.

Both subscales demonstrated good internal consistency in the current sample (α

Aggression = .88, α Attention = .77). Additionally, adolescents responded to the Anger,

Risk-seeking, and Impulsivity scale (ARI; Grasmick, Tittle, Bursik, & Arneklev, 1993).

This is a 13 item scale containing Temper, Risk-seeking, and Impulsivity subscales, all of

which demonstrated good internal consistency in the present study (α Temper = .86, α

Risk-seeking = .85 , α Impulsivity = .63). Mean scores were computed for each of these

subscales.

Mothers' substance history

Mothers were asked about their use of alcohol and illicit drugs at Waves 1 and 3.

At Wave 1, mothers were asked how often they used drugs ("never" to "everyday"). At

this time, they also reported whether they had been in treatment for either drug or alcohol

problems and the number of years during which they had "drunk heavily" during their

life. Heavy drinking duration was divided by age at Wave 1, to account for the fact that

older mothers have had more time during which to develop patterns of heavy alcohol use.

At Wave 3, mothers responded to the following questions about the timing of their

substance use initiation: "How old were you the first time you drank enough to feel

drunk or very high?" and "How old were you the first time you used drugs or narcotics?"

To allow the retention in analyses of mothers who reported never being drunk and/or

using drugs, missing data about age of initiation were imputed; these women's age at

Wave 3 was entered to replace missing data about the timing of initiation. Thus, these

women became, by default, "late initiators." Variables reflecting women's lifetime

history of substance use (i.e., age first drunk, age first "high", duration of heavy drinking, and substance use treatment) were combined to form a latent factor (see Plan of Analysis).

Girls' substance use

At Wave 3, adolescents responded to a series of questions regarding their patterns of drug use and problem drinking. Participants were asked whether they had ever tried any of the following substances, and if so, how often they had used them in the month prior to the interview: marijuana, inhalants, crack or cocaine, crystal methamphetamine, and other drugs like heroin, uppers, or hallucinogens. Scores tapping the diversity of girls' drug use were computed by summing the number of different drugs they had ever used. Frequency scores were computed by taking the mean frequency of use, defined as number of using days per month, for all drugs used. In completing the CBC, participants responded to the question "I use drugs or alcohol for non-medical purposes" (response scale: 0 – not true, 1 – somewhat true, 2 – very true). Finally, at Wave 3, adolescents also responded to a series of 13 questions designed to tap alcohol abuse and dependence (Dielman, 1994; Maggs, 1997). These questions are listed in Appendix B, and had a Chronbach's alpha of .90. Problem drinking was included, as opposed to any drinking, in light of research suggesting that occasional or experimental alcohol use in adolescence is normative, and is positively associated with social functioning in college student samples (e.g., Maggs, 1997). Drug use diversity, drug use frequency, the single CBC item, and problem drinking scores were combined to form a latent Child Substance Use factor (see Plan of Analysis below).

CHAPTER 3: RESULTS

Plan of Analysis

Measurement models

Confirmatory Factor Analysis (CFA) will be used to create latent factors

representing several key constructs that will be used in analyses. The use of latent

factors, as opposed to observed scores, offers several advantages. Measurement error can

be modeled, and the common variance of several items or scale scores tapping the same

theoretical construct can be isolated. Additionally, confirmatory analysis of latent factors

provides a test of the implied hypothesis that included items or scale scores do, in fact,

reflect a common underlying construct.

Individual factors will be constructed as follows: The variables tapping girls'

drug use and problem drinking, namely drug use diversity and frequency scores, CBC

item scores, and problem drinking scores, will be combined to create a latent factor

(Child Substance Use). Since these variables are based on different response scales,

scores will be standardized prior to analysis. Similarly, maternal scores from the

measures of heavy drinking duration, substance use treatment participation, timing of

drug use initiation, and timing of first episode of drunkenness will be combined to form a

latent factor (Maternal Substance History). Again, individual variables will be

standardized prior to analysis because they are based on differing response scales (see

Table 4 for intercorrelations of observed variables for girls and mothers).

Table 4.

Intercorrelations of maternal and child substance use variables.

	1	2	3	4	5	6	7	8
Maternal substance use history								
1. Years drank heavily	-							
2. Received treatment	.32	-						
3. Age first got drunk	-.33	-.29	-					
4. Age first used drugs	-.25	-.44	.41	-				
Child substance use								
5. Problem drinking					-			
6. Drug use diversity					.64	-		
7. Drug use frequency					.55	.44	-	
8. CBC item					.60	.54	.52	-

All correlations are significant at $\underline{p} < .01$.

A Pubertal Timing factor will be constructed for girls by combining information about the timing of breast growth, body hair growth, and body changes with reports of age at menarche. The range of inter-correlations among these variables supports their combination (see Table 5). Data about timing of skin changes will be dropped, as this variable is not correlated with other pubertal timing variables.

Scores from measures of self-esteem, suicidality, and depression will be combined to form a Depressive Self-Concept factor for girls. The inclusion of self-esteem, depression, and suicidal ideation in a common factor is supported by the work of Harter (1999). She advocates a model of self-worth that incorporates self-esteem, depression, and hopelessness into a "depression/adjustment composite." In the present study, suicidality is substituted for hopelessness, and the phrase "depressive self-concept" is used to describe the resulting construct. It is arguable that suicidal ideation represents extreme levels of despair, making it an appropriate substitute for hopelessness and conceptually related to both depression and low self-worth. High intercorrelations among these variables support their combination (see Table 5).

A Behavioral Under-Control factor will be created by combining scores on the Aggression and Attention Problems subscales of the CBC, and scores on the Temper, Risk-seeking, and Impulsivity subscales of the ARI (see Table 5 for intercorrelations). This combination of scales is quite similar to several of the disinhibition factors used in previous research (e.g., Dawes et al., 1997). EQS (Bentler, 1989) will be used to test all factor models.

Table 5.

Intercorrelations of factor indicators – hypothesized mediators.

	1	2	3	4	5	6	7	8	9	10	11	12
Depression/ self- worth												
1. Suicidality	-											
2. Depression	.52	-										
3. Self-esteem	.38	.50	-									
Early pubertal timing												
4. Timing: body hair				-								
5. Timing: body changes				.61	-							
6. Timing: breast devel.				.42	.53	-						
7. Age at menarche				-.28	-.33	-.35	-					

All correlations are significant at p < .01.

Table 5 (cont.).

Intercorrelations of factor indicators – hypothesized mediators.

	1	2	3	4	5	6	7	8	9	10	11	12
Behavioral under-control												
8. Temper								-				
9. Aggression								.67	-			
10. Attention Problems								.49	.69	-		
11. Impulsivity								.53	.47	.46	-	
12. Risk taking								.50	.52	.43	.62	-

All correlations are significant at $p < .01$.

Structural models

Two types of structural modeling will be used to test study hypotheses: multiple regression analysis and Structural Equations Modeling (SEM). A two-step approach to SEM will be used, in which measurement models are run first and resulting factor loadings and error variances are transferred to structural models. This procedure allows for complex models involving both measurement and structural components to be run while requiring smaller sample sizes than if both measurement and structural models were estimated simultaneously (Anderson & Gerbing, 1988). EQS (Bentler, 1989) will be used to test all SEM's. The plan of analysis for structural models is broken down below by study question.

Question 1: Is the link between childhood sexual abuse and later substance use explained by other, co-occurring forms of abuse? It is expected that childhood sexual abuse will uniquely predict drug and alcohol use in adolescence when age and other forms of abuse (physical child abuse and exposure to marital violence) are included in statistical models. Several of these predictors are likely to be interrelated, therefore hierarchical regression will be used to address this question. The dependent variable in this case will be a substance use factor score, created by combining girls' drug use diversity, drug use frequency, CBC item, and problem drinking scores using SPSS. Sexual abuse will be entered last, providing a strict test of its predictive power and allowing a determination of its independent contribution to adolescent substance use.

Question 2: Is the link between childhood sexual abuse and later substance use explained by mother-daughter transmission of risk? Question 2 tests whether mothers' sexual abuse and substance use histories will be echoed in the lives of their daughters. Intergenerational transmission will be evaluated using SEM. Child age at Wave 2 will be included in the full structural model, because the sexually abused girls are significantly older than the non-abused girls (abused $\underline{M}$ = 15.2 years, non-abused $\underline{M}$ = 14.1 years; $\underline{t}$(138) = -3.33, $\underline{p}$ = .00), and because substance use increases with age during adolescence.

Question 3: What are the pathways to substance use for sexually abused girls? Hypotheses tied to Question 3 are that 1) depressive self-concept, 2) early pubertal timing, and 3) behavioral under-control will each mediate the relationship between childhood sexual abuse and adolescent substance use. It is also expected that depressive

self-concept and behavioral under-control will be interrelated. Because SEM is able to model complex interrelationships, it will be used to test these hypotheses. To maintain the maximum ratio of participants to parameters being estimated, a series of 4 models will be run. First, each of the three mediators will be tested in a separate analysis. Then, a fourth SEM including both depressive self-concept and behavioral under-control will be evaluated. In each of these 4 models, maternal context variables (maternal sexual abuse and maternal substance use history) will also be included (see Figures 6, 7, 8, and 9 in RESULTS). Child age will again be included in the full structural models to account for the age difference between sexually abused and non-abused girls and to model the effects of age on substance use.

Finally, a series of hierarchical regressions will address the potential confounding influence of physical child abuse and exposure to domestic violence in the relationships between child sexual abuse and each of the three hypothesized mediators. It is expected that sexual abuse will be related to these mediators when other forms of abuse are controlled statistically.

<div align="center">Descriptive Findings</div>

Sexual abuse

Mothers. Fifty-three percent ($n = 80$) of the mothers reported a history of sexual abuse (i.e., had a sexual abuse severity score > 0) in their own life. There was a large degree of overlap between mothers' and daughters' sexual victimization; 74.4% of girls who were sexually abused had mothers who were also abused. Of those women who were sexually abused, 39% had daughters who were later abused, and 61% of

victimized mothers had daughters who were not abused. There was a significant

bivariate relationship between women's experience with childhood sexual victimization

and their later involvement in domestic violence (χ^2 (139) = 19.71, p = .00). Of the

women who were battered by their romantic partner(s), 67.0% had a history of childhood

sexual victimization. Of the women who were sexually abused in childhood, 85.5% went

on to be involved in violent relationships.

Daughters.   Forty-three (41%) of the girls were identified as sexually abused.

Victims ranged in age from 2 years to 14 years at the time of first victimization. Seventy-

nine percent of the reported abuse incidents occurred prior to the Wave 1 interview; 92%

of the girls were under age 12 at Wave 1. At Wave 1, 24 of the girls and 29 of the

mothers reported sexual abuse of the daughter. When sexual abuse was reported, 61% of

the mothers and children described the same incident. In the remaining cases, abuse of

the daughter was reported by only one of the respondents (n = 9 mother only reports, n =

4 child only reports). At Wave 2, the proportion of mothers and daughters describing the

same incident was 21%, with 3% of the pairs both reporting sexual abuse, but different

incidents. In 18% of Wave 2 cases, mothers were the only reporters of their daughter's

abuse and in 59% of cases girls were the sole reporters of their own experience. Sixty-

eight percent of the families reporting sexual abuse of the daughter at Wave 1 also

reported abuse at Wave 2, and 20 new reports of sexual abuse were made at Wave 2.

Chi-square tests revealed a significant univariate relationship between girls'

sexual abuse history and the presence of domestic violence in the home (χ^2 (133) = 5.08,

p = .02). When participants were split based on the duration of exposure to domestic

violence variable (duration = 0 versus duration > 0), findings showed that 83% of the

sexually abused girls came from homes where there was marital violence. In examining

only the girls in the sample exposed to marital violence, those who were sexually abused

were exposed for a somewhat longer period (abused $\underline{M}$ = 6.97 years, non-abused $\underline{M}$ = 5.1

years, $\underline{t}$(131) = -1.91, $\underline{p}$ = .06). Exposure to physical abuse was also significantly related

to girls' sexual abuse status in univariate tests (χ^2 (133) = 12.10, $\underline{p}$ = .00); 53% of girls

reporting sexual abuse had also experienced physical abuse, according to either maternal

or child reports. Two-level variables indexing the presence of all three types of abuse

among girls were significantly correlated as follows: sexual abuse and physical abuse ($\underline{r}$ =

.31), sexual abuse and marital violence ($\underline{r}$ = .19), physical abuse and marital violence ($\underline{r}$ =

.23). See Table 6 for descriptive information about the marital violence and physical

abuse experienced by girls in the sample at Wave 1.

Table 6.

Proportion of girls experiencing various types of physical abuse and marital violence.

Type of abuse	Sexually abused girls	Non-abused girls
Physical child abuse		
Beat/bruised child	18%	11%
Punched/kicked child	10%	7%
Burned child	0%	0%
Hit child with object	35%	29%

Type of abuse	Sexually abused girls	Non-abused girls
Marital violence		
Beat mother for several minutes	45%	32%
Choked mother	38%	33%
Threatened mother w/ weapon	30%	17%
Used weapon		
	8%	8%

Proportions are presented by sexual abuse group and based on maternal report at Wave 1.

Substance use

Mothers.   Sexual abuse in childhood was associated with earlier and more severe substance use among the mothers. Women sexually abused in childhood reported significantly earlier first experiences with getting drunk (abused $\underline{M}$ = 15.4 years of age vs. non-abused $\underline{M}$ = 19.0 years of age, $\underline{p}$ = .00) and tended to report using drugs at a younger age (abused $\underline{M}$ = 18.7 years vs. non-abused $\underline{M}$ = 21.3 years, $\underline{p}$ = .06) compared to non-abused women. Adult victims of sexual abuse reported drinking heavily during a greater proportion of their life (abused $\underline{M}$ = .06 vs. non-abused $\underline{M}$ = .03, $\underline{p}$ = .05). Finally, they were significantly more likely to have received treatment for alcohol or drug problems than were non-victims (χ^2 (137) = 13.65, $\underline{p}$ = .00; see Table 7). Thirty percent of sexually abused women had participated in substance use treatment, compared to 5% of non-abused women.

Table 7.

Differences in mothers' substance use by maternal sexual abuse group.

Mothers' substance use	Abused	Non-abused	$\underline{t}(\underline{df}) =$	$\underline{p} =$
	$\underline{M}\,(\underline{SD}) =$	$\underline{M}\,(\underline{SD}) =$		
Age first got drunk	15.4 (2.9)	19.0 (5.0)	4.67 (82.1)	.00
Age first used drugs	18.7 (3.8)	21.3 (6.1)	1.98 (36.9)	.06
Proportion of life spent drinking heavily	.06 (.11)	.03 (.07)	-2.01 (134.1)	.05

Daughters.   Differences in girls' substance use rates based on sexual abuse group are presented in Figure 1. Chi-square analysis revealed that a higher percentage of abused girls reported using marijuana, cocaine, crystal methamphetamine, and heroine/uppers/hallucinogens/ other drugs when compared to non-abused girls (all differences significant at $\underline{p} < .01$). Inhalant use did not differ significantly between groups. Sexually abused girls also reported using a larger number of different drugs at Wave 3 (abused $\underline{M} = 1.8$ vs. non-abused $\underline{M} = .77$, $\underline{p} = .00$), and used any drug on more days per month than non-abused girls (abused $\underline{M} = 1.1$ days vs. non-abused $\underline{M} = .4$ days, $\underline{p} = .04$). Eighteen percent of victimized girls reported never using any drugs, compared to 55% percent of comparison girls. Finally, the sexually abused girls reported significantly higher levels of problem drinking than other girls (abused $\underline{M} = .26$ vs. non-abused $\underline{M} = -.1$, $\underline{p} = .02$; see Table 8).

Figure 1.

Differences in girls' substance use rates by abuse group.

Table 8.

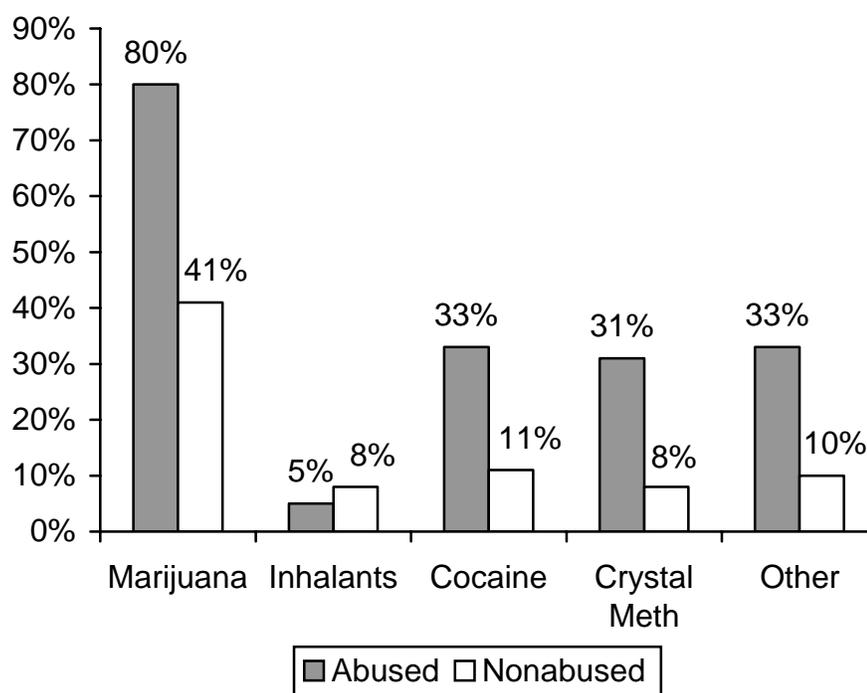Differences in adolescent girls' substance use by child sexual abuse group.

Daughters' substance use	Abused M (SD) =	Non-abused M (SD)=	t(df) =	p =
Problem drinking	.26 (.88)	-.12 (.48)	-2.53 (46.8)	.02
Drug use diversity	1.82 (1.6)	.77 (1.2)	-3.82 (55.0)	.00
Drug use frequency	1.11 (2.1)	.37 (1.3)	-2.07 (49.3)	.04

Pubertal timing

There were no significant univariate differences between the sexually abused and non-abused girls on the pubertal timing variables (See Table 9). The victimized girls did not report changes in body hair, body shape, breast development, or menarcheal status at an earlier age when compared to other girls.

Depressive self-concept

Abused girls differed from the comparison girls on two of the three indicators of depressive self-concept. Levels of low self-esteem ($t(137) = -.260$, $p = .01$) and depression ($t(138) = -2.74$, $p = .01$) were increased among abused girls; levels of suicidality did not differ between groups (see Table 9).

Behavioral under-control

T-tests suggest differences between victimized and non-victimized girls on all of the variables associated with behavioral under-control. The temper ($t(137) = -2.71$, $p = .01$), aggression ($t(52.4) = -2.71$, $p = .01$), attention problems ($t(137) = -3.50$, $p = .00$), impulsivity ($t(137) = -3.34$, $p = .00$), and risk-taking ($t(137) = -3.35$, $p = .00$) scales all revealed elevated scores among sexually abused girls (see Table 9).

Table 9.

Differences in hypothesized mediating variables by girls' sexual abuse group.

Factor	Abused	Non-abused	t(df) =	p =
Indicators	M (SD) =	M (SD) =		
Depressive self-concept				
Low self-esteem	2.08 (.57)	1.83 (.50)	-2.60 (137)	.01
Depression	1.89 (.52)	1.64 (.46)	-2.74 (138)	.01
Suicidality	1.25 (.54)	1.08 (.21)	-1.94 (42.4)	ns
Early pubertal timing				
Timing: body hair	2.05 (.74)	1.97 (.72)	-.60 (135)	ns
Timing: body changes	2.28 (.72)	2.03 (.72)	-1.86 (137)	ns
Timing: breast devel.	2.09 (.72)	2.09 (.72)	-.07 (138)	ns
Age at menarche	12.21 (1.2)	11.96 (.89)	-1.14 (52.3)	ns
Behavioral under-control				
Temper	2.42 (.75)	2.04 (.75)	-2.71 (137)	.01
Aggression	.68 (.42)	.48 (.30)	-2.71 (52.4)	.01
Attention Problems	.77 (.42)	.52 (.37)	-3.50 (137)	.00
Impulsivity	2.26 (.62)	1.92 (.52)	-3.34 (137)	.00
Risk taking	2.48 (.65)	2.05 (.68)	-3.35 (137)	.00

Results of measurement models

Confirmatory factor analysis supported the hypothesized maternal substance use

history and child substance use factors; for both of these factors, higher scores are

indicative of more severe substance use. All factor loadings were above .40, and overall

model fit was good (χ^2(19,121) = 22.23, p = .28; NNFI = .98; CFI = .99; RMSEA (90%

CI) = .04 (0 - .09)). The maternal substance use history and child substance use factors

were significantly correlated, r = .36 (see Figure 2).

Figure 2. Mother and child substance use factor loadings.
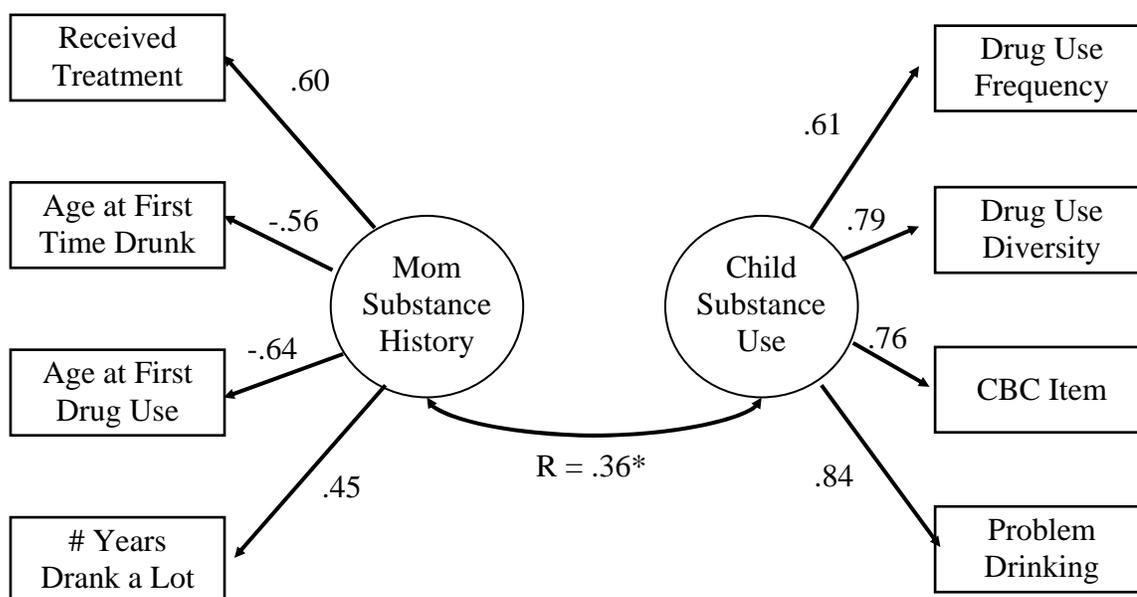
Results of CFA were supportive of the depressive self-concept, early pubertal

timing, and aggression/impulsivity factors. Two separate measurement models were run

to maximize the available sample size. The depressive self-concept and early pubertal

timing factors were evaluated together, as the former had only three indicators and

needed additional specifications in the model to achieve mathematical identification.

Model fit was good (χ^2(13,121) = 14.84, p = .32; NNFI = .98; CFI = .99; RMSEA (90%

CI) = .04 (0 - .10)), and the two factors were not significantly correlated ($\underline{r}$ = -.04). As

seen in Figure 3, factor loadings for both constructs are all above .4 as desired, with the

exception of age at menarche on the pubertal timing factor.

Figure 3. Self-worth and pubertal timing factor loadings.
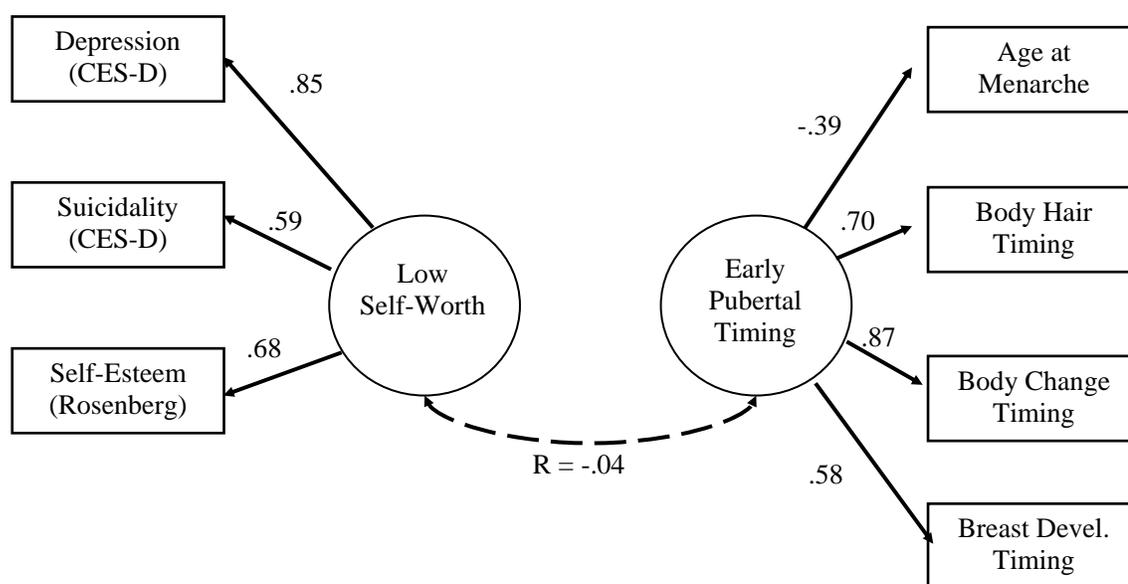
In order to achieve acceptable fit for the behavioral under-control factor, it was

necessary to specify correlated error terms among some of the indicators. Based on the

results of the Lagrangian Multiplier Test available in EQS, error terms from the two

subscales of the CBC were correlated, as were the error terms from the impulsivity and

risk-taking subscales of the ARI. This adjustment to the measurement model was

empirically motivated. The final measurement model for the behavioral under-control

construct is presented in Figure 4. All factor loadings were sufficiently high, suggesting

that the indicators share a good deal of variance. Model fit was acceptable ($\chi^2(3,121)$ =

7.18, $\underline{p}$ = .06; NNFI = .95; CFI = .98; RMSEA (90% CI) = .11 (0 - .21)). It was not

necessary to include additional factors or specifications in this measurement model, as

there were 5 indicators for the single factor, making the model mathematically identified.

Figure 4. Aggression/impulsivity factor loadings.

.43

.33

e e   e e

| Aggression (CBC) | Attention (CBC) | Impulsivity (ARI) | Risk-Seeking (ARI) |

.77   .59   .63   .66

Temper (ARI)

Aggression/ Impulsivity

.86
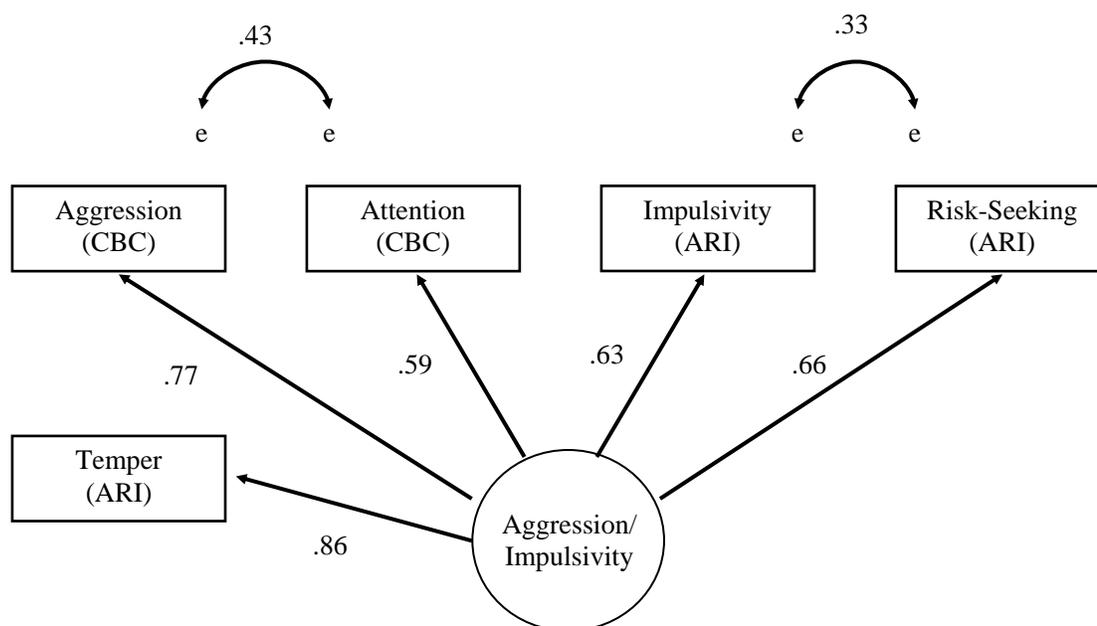
Results of structural models

Question 1: Is the link between childhood sexual abuse and later substance use explained

by other, co-occurring forms of abuse?

As predicted, girls' childhood sexual abuse was related to their substance use in

adolescence, even when exposure to domestic violence, physical child abuse, and age

were considered (see Table 10). Measures of the duration of domestic violence exposure,

physical abuse, age, and sexual abuse severity were used hierarchically and in that order

to predict substance use factor scores created in SPSS. Factor scores combined the 4

measures of adolescent substance use: drug use diversity, drug use frequency, CBC item,

and problem drinking score. As noted above, CFA supported the combination of these indicators into a common factor. The overall model was supported, and explained 22% of the variance in substance use factor scores ($\underline{F}(4,132) = 9.17$, $\underline{p} = .00$) for girls. Results of the hierarchical regression showed that age ($\underline{F}(1,132) = 5.39$, $\underline{p} = .02$) and sexual abuse severity ($\underline{F}(1,132) = 15.46$, $\underline{p} = .00$) were significantly related to girls' substance use factor scores, whereas duration of domestic violence exposure ($\underline{F}(1,132) = .18$, $\underline{p} = ns$) and physical child abuse ($\underline{F}(1,132) = 1.23$, $\underline{p} = ns$) were not.

Table 10.

Hierarchical regression predicting girls' adolescent substance use factor scores.

Predictor	β ($\underline{SE}$)	$\underline{F}(1,132) =$	$\underline{p} =$
DV exposure duration	.01 (.02)	.18	ns
Physical abuse	.19 (.17)	1.23	ns
Age	.10 (.04)	5.39	.02
Sexual abuse severity	.12 (.03)	15.46	.00
Overall model		$\underline{F}(4,132) = 9.17$	.00
$R^2 = .22$			

It was also possible that marital violence could confound the relationship between sexual victimization and substance use among the mothers. To address this concern, a similar regression was conducted in which maternal sexual abuse severity and the duration of exposure to domestic violence variable were used to predict mothers' substance use history factor scores. Again, factor scores were created in SPSS and included the 4 maternal substance use history indicator variables that were confirmed by

CFA: age drunk for the first time, age of first narcotics use, proportion of life drinking

heavily, and substance use treatment participation. The overall F-test supported this

model ($\underline{F}$(2,132) = 9.15, $\underline{p}$ = .00). Both the duration of exposure to domestic violence

($\underline{F}$(1,132) = 4.13, $\underline{p}$ = .04, β($\underline{SE}$) = -.03(.01)) and sexual abuse severity ($\underline{F}$(1,132) = 7.85,

$\underline{p}$ = .01, β($\underline{SE}$) = -.07(.03)) were significant predictors of mothers' substance use history

scores, and accounted for 12% of the variance in these scores. The negative beta-weights

are the result of automated factoring procedures used by SPSS. These procedures

resulted in a factor score in which higher values are reflective of <u>less severe</u> substance

use. Thus, in the above regression, domestic violence and sexual abuse have a negative

relationship to less severe substance use history, and, therefore, a positive relationship to

more severe substance use history.

<u>Question 2: Is the link between childhood sexual abuse and later substance use explained</u>

<u>by mother-daughter transmission of risk?</u>

Results of the structural model supported most of the hypotheses associated with

Question 2 (see Figure 5). Maternal sexual abuse severity was significantly related to

daughters' sexual abuse severity and to increased maternal substance use history.

Maternal substance use history, in turn, was predictive of daughters' substance use.

Finally, childhood sexual abuse posed a significant risk for substance use among

daughters, even when maternal contextual factors were considered.

The hypothesis that maternal substance use history would contribute significantly to

daughters' risk for sexual abuse was not supported. No significant decrement in model

fit occurred when the non-significant path between maternal substance use history and

child sexual abuse was dropped. This result appears inconsistent with earlier published

results based on the same sample (McCloskey & Bailey, 2000). In the present study,

however, maternal substance use history was measured, but in prior research frequency of

drug use was measured. Therefore, a regression was run to address this discrepancy. The

mothers' sexual abuse severity variable ($\underline{t}(135) = 3.32$, $\underline{p} = .00$) and maternal reports of

drug use frequency ($\underline{t}(135) = 2.49$, $\underline{p} = .01$) at Wave 1 both predicted significantly scores

on the daughters' sexual abuse severity variable ($R^2 = .12$).

Figure 5. Model 1.
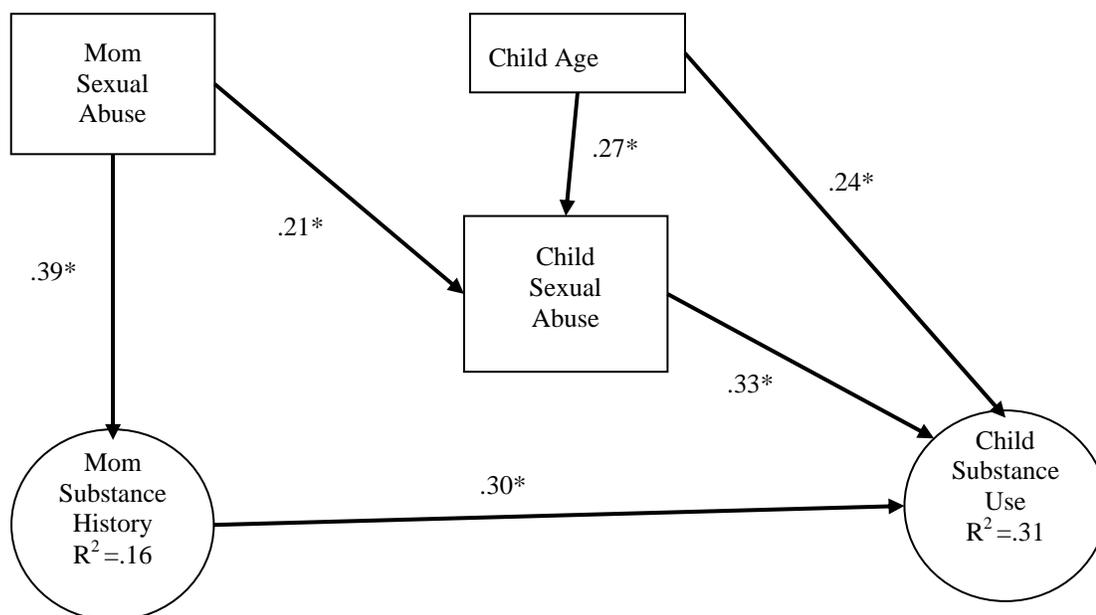
Wave 3

The final version of the SEM is shown in Figure 5, and demonstrated excellent fit

to the data ($\chi^2(55,121) = 48.02$, $\underline{p} = .74$; NNFI = 1; CFI = 1; RMSEA (90% CI) = 0 (0 -

.04)). The model explained 31% of the variance in child substance use. In addition to

maternal substance use history and child sexual abuse severity, girls' age was a

significant predictor of their substance use. For both mothers and daughters, standardized

parameter estimates suggest that the relationship between childhood sexual victimization

and later substance use is of moderate size (.39 and .33, respectively). The indirect effect

of mothers' sexual abuse on their daughter's substance use can be obtained by summing

the values of the two indirect pathways through increased maternal substance use history

and increased risk for child sexual abuse, as follows: (.39)(.30) + (.21)(.33) = .19. Thus,

childhood sexual victimization among mothers, in this model, carries important

consequences not only for the women themselves, but for their daughters as well.

Question 3: What are the pathways to substance use for sexually abused girls?

The first of 4 full SEM's tested early pubertal timing as a mediator of the effects

of sexual abuse on adolescent substance use (see Figure 6). Overall model fit was

excellent (χ^2(106,121) = 105.31, $\underline{p}$ = .50; NNFI = 1; CFI = 1; RMSEA (90% CI) = .0 (0 -

.05)). As expected, the influence of maternal sexual abuse history and substance use on

daughters' risk for sexual abuse and substance use persisted as discussed in the section on

results for Question 2. Findings were not supportive of a mediational role for early

pubertal timing. Childhood sexual abuse was significantly and positively associated with

the factor assessing early pubertal timing; sexual abuse severity explained about 4% of

the variance in the pubertal timing factor. Early pubertal timing, however, was not

significantly related to girls' substance use, and the relationship between child sexual

abuse and adolescent substance use remained substantial. Together, maternal substance

use history, early pubertal timing, child sexual abuse, and age explained 33% of the

variance in adolescent substance use.

Figure 6. Model 2.
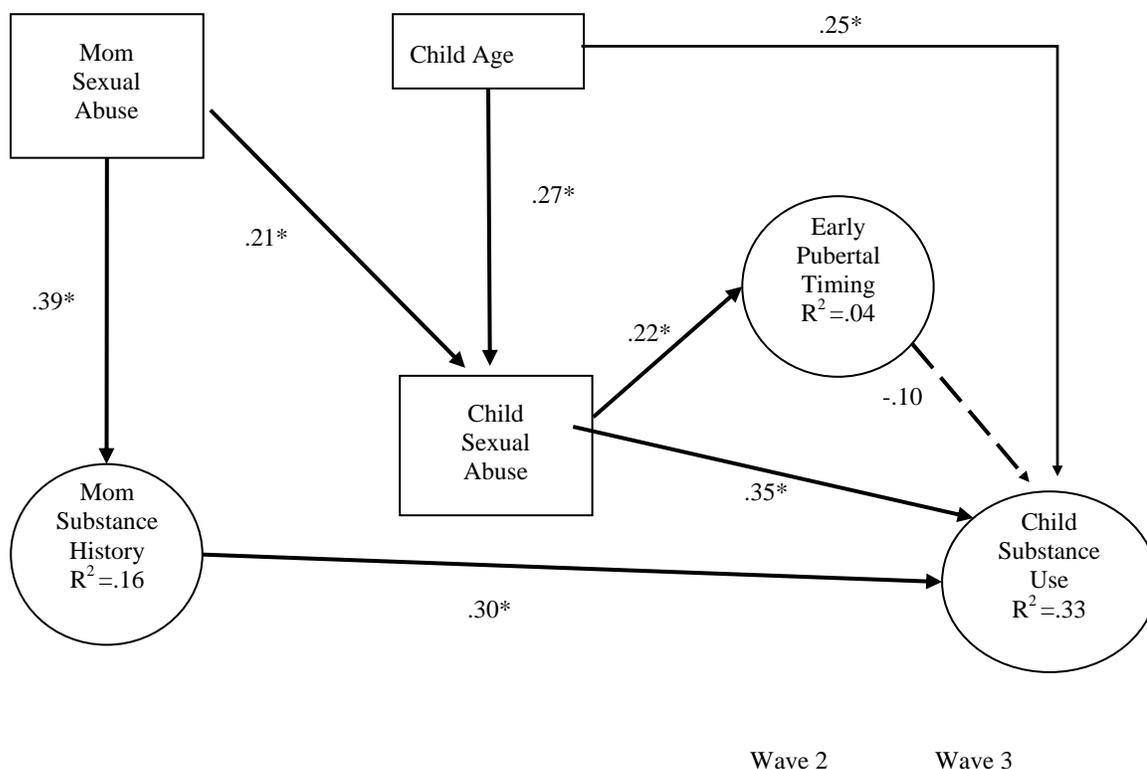
The second model tested the depressive self-concept factor as a mediator between

childhood sexual abuse and later substance use (see Figure 7). This model also fit the data

quite well (χ^2(91,121) = 90.14, p = .51; NNFI = 1; CFI = 1; RMSEA (90% CI) = .0 (0 -

.05)). Once again, parameter estimates for the relationships between maternal family

context variables, child sexual abuse and child substance use remain nearly identical.

Results indicate that depressive self-concept does not mediate the impact of sexual abuse

on substance use for girls. Childhood sexual abuse was significantly associated with

depressive self-concept, but depressive self-concept was not significantly related to

substance use in adolescence. The inclusion of the depressive self-concept factor does,

however, reduce the size of the relationship between child sexual abuse and substance use

somewhat (.33 to .26). Sexual abuse severity explained 14% of the variance in

depressive self-concept. The model as a whole explained 33% of the variance in

adolescent substance use.

Figure 7. Model 3.
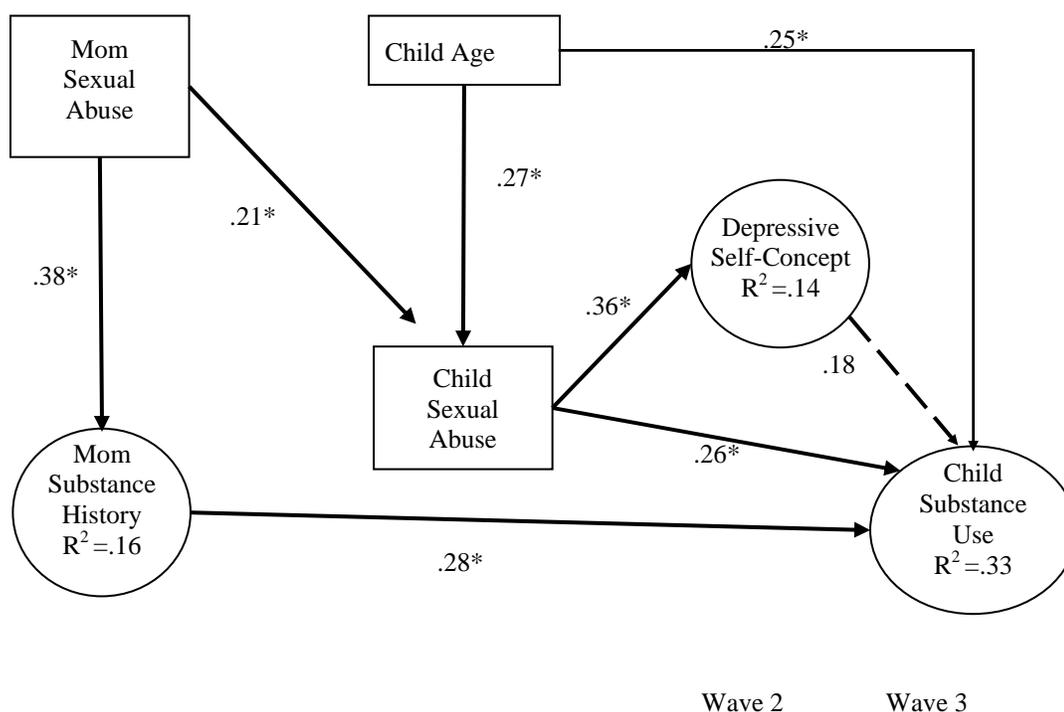
Results of the third full model show that the behavioral under-control factor mediates the

effects of child sexual abuse on adolescent substance use among the girls in the study

(see Figure 8). Child sexual abuse severity was positively related to behavioral under-

control, which was in turn significantly associated with adolescent substance use. The

observed mediation was partial, since there remained a significant although much

reduced relationship between childhood sexual abuse and substance use. The inclusion

of the behavioral under-control factor reduced the parameter estimate linking sexual

abuse severity and substance use from .33 to .19. Girls' sexual abuse severity accounted

for 12% of the variance in their behavioral under-control. The model accounted for 45%

of the variance in adolescent substance use. Model fit was excellent (χ^2(122,121) =

125.58, p = .39; NNFI = .99; CFI = .99; RMSEA (90% CI) = .02 (0 - .05)).

Figure 8. Model 4.

Wave 2   Wave 3
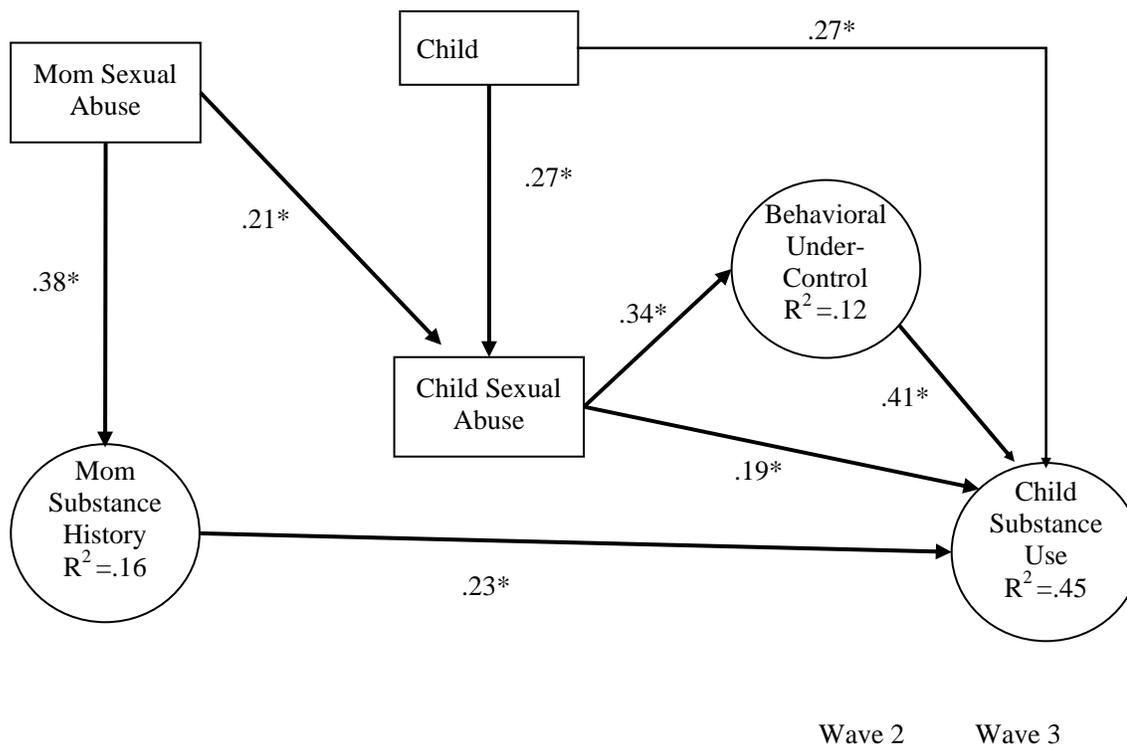
A final model was tested to examine the interrelation of depressive self-concept and behavioral under-control and their communal role as mediators in the relationship between childhood sexual abuse and substance use (see Figure 9). Results from this model suggest that depressive self-concept is a mediator of the effects of sexual abuse on behavioral under-control, which in turn predicts substance use. When both of these factors were included, childhood sexual abuse was related to depressive self-concept, but the significant relationship between sexual abuse and behavioral under-control shown in Figure 8 became non-significant. Sexual abuse severity explained 16% of the variance in depressive self-concept, and sexual abuse and depressive self-concept together explained 52% of the variance in behavioral under-control. Behavioral under-control remained significantly related to adolescent substance use. The model demonstrated excellent fit (χ^2(173,121) = 188.58, $\underline{p}$ = .20; NNFI = .98; CFI = .98; RMSEA (90% CI) = .03 (0 - .05)), and explained 44% of the variance in girls' substance use. Parameter estimates of other relationships in the model remained virtually unchanged from those presented in Figure 5.

Figure 9. Model 5.
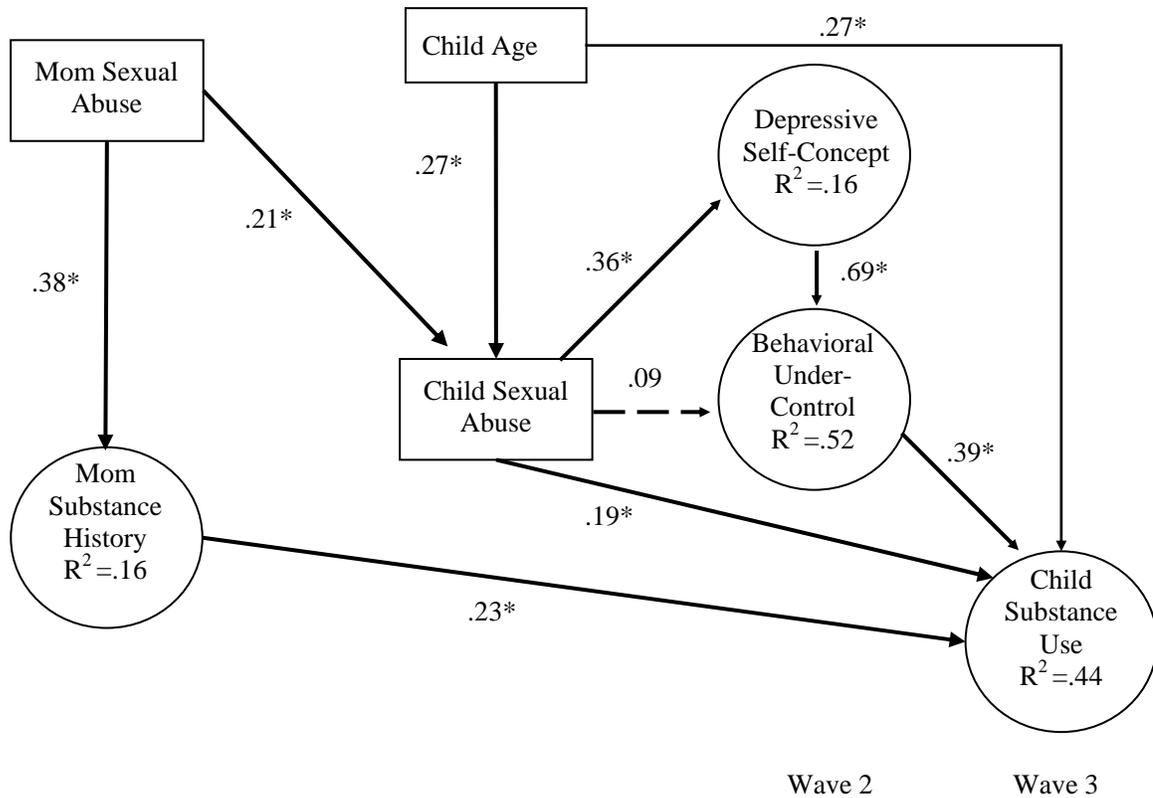
Consistent with expectations, the results of a series of hierarchical regressions

suggest that the significant relationships reported above between childhood sexual abuse

and the hypothesized mediators are not due to the confounding presence of physical child

abuse or domestic violence. Neither the dichotomous physical abuse variable nor the

continuous duration of exposure to domestic violence was significantly related to any of

the mediating factors described above (see Table 11). The model predicting early

pubertal timing factor scores was not supported, so no results for the individual predictors

are presented in that case.

Table 11.

Hierarchical regressions testing potential confounds in the relationship between child sexual abuse and scores on hypothesized mediating factors.

	β (SE)	F(1,132) =	p =
Dependent factor:	Depressive self-concept		
DV exposure	.03 (.01)	3.12	ns
Physical abuse	.20 (.16)	1.56	ns
Sexual abuse severity	.10 (.03)	11.41	.00
Overall model	R^2 = .15	F (3,132) = 7.46	.00
Dependent factor:	Early pubertal timing		
Overall model	R^2 = .02	F (3,128) = .91	ns
Dependent factor:	Behavioral under-control		
DV exposure	.02 (.02)	1.96	ns
Physical abuse	.28 (.17)	2.61	ns
Sexual abuse severity	.11 (.03)	13.28	.00
Overall model	R^2 = .16	F (3,131) = 8.30	.00

CHAPTER 4: DISCUSSION

The aims of this study were threefold: to replicate the link between childhood sexual abuse and later substance use when using a longitudinal design and controlling for co-occurring forms of abuse, to highlight intergenerational parallels between sexual victimization and substance use in the lives of mothers and daughters, and to identify some pathways to substance use among sexually abused girls.

The first aim was achieved. The results of the current study are consistent with a large body of existing, retrospective research suggesting that sexual victimization in childhood is related to later substance use when age, sex, ethnicity, family alcohol/drug use patterns (e.g., Kilpatrick et al., 2000), family dysfunction, psychopathology, and early deviant behavior (e.g., Spak et al., 1998) are statistically controlled. The findings reported here suggest that this link can be demonstrated prospectively, and that physical abuse and witnessing marital violence can potentially be added to the list of confounds in the presence of which sexual abuse has unique predictive power.

Over-sampling for marital violence makes this sample unique as a forum for investigating the link between childhood sexual abuse and substance use. In fact, given the high levels of violence witnessed by some girls in the study, it is somewhat surprising that sexual abuse shows as much predictive power as it does. It may be that sexual victimization is a particularly insidious form of abuse when compared to physical abuse and exposure to marital violence. Cultural norms regarding female chastity and sexual gatekeeping (e.g., McCloskey, 1997), as well as the secrecy and shame that often surround sexual abuse may make it particularly damaging to the development of girls and

women. It may be that witnessing and/or experiencing physical violence does not have

the same meaning to girls in terms of their value in society. Also, victims or witnesses of

physical violence may be less likely to blame themselves, but sexual abuse often involves

explicit victim-blaming by perpetrators and others (Finkelhor & Browne, 1985).

Alternatively, it is possible that both exposure to marital violence and physical abuse may

moderate the impact of sexual abuse, such that sexual abuse becomes more damaging in

the presence of other forms of abuse. Although this possibility was not investigated in

the present study, some evidence exists in support of the idea (e.g., Bensley, Van

Eenwyk, Spieker, & Schoder, 1999; Luster & Small, 1997).

The use of a longitudinal design represents an improvement over much existing

work on the effects of sexual abuse. This study was not entirely prospective because

79% of girls' sexual abuse occurred before initial data collection. In all cases, however,

sexual abuse among the girls in the sample occurred prior to the assessment of mediators,

and both occurred and was measured prior to the assessment of adolescent substance use.

Therefore, sexual abuse did temporally precede the measurement of mediators and of

substance use among girls. Given the results of this study and the wealth of other data

linking sexual abuse with later drug and alcohol use/abuse, a conclusion that childhood

sexual victimization raises the risk of later substance use in a variety of family contexts

seems warranted.

The second aim, to identify intergenerational parallels between the victimization

and substance use experiences of mothers and daughters, was also achieved. Among

participants in this study, mothers' experiences with childhood sexual abuse and later

substance use were mirrored in the lives of their daughters. Specifically, childhood sexual victimization in one generation translated into increased risk in the next generation, and substance use among mothers was positively related to substance use among daughters. Analyses revealed that a factor indexing early onset and severity of substance use (i.e., substance use history) among women was not predictive of sexual abuse risk for their daughters. Consistent with previously published findings from this sample (McCloskey & Bailey, 2000), the frequency of mothers' drug use when the girls were young did predict sexual abuse severity among daughters. This suggests that perpetrators of sexual abuse may take advantage of mothers' situational unavailability in terms of protecting their daughters, and that mothers' lifetime patterns of substance use pose less of a risk for their children. Alternatively, mothers may have temporarily increased the frequency of their drug use in response to the victimization of their daughters. The current study is unable to address the order of causality between these two phenomena. Very few studies of the effects of sexual abuse, however, include information on maternal victimization, and it is a strength of this study that such data are included.

The finding that maternal substance use history was predictive of girls' substance use is consistent with the literature on familial transmission of substance use reviewed herein (e.g., Hawkins et al., 1992). Given the low heritability of substance use for girls (e.g., McGue, Iacono, Legrand, & Elkins, 2001), environmental mechanisms must be sought for explanation of this link. Although not specifically investigated here, parenting practices and modeling of substance use behavior and/or attitudes supporting such

behavior are likely modes of transmission. Future research should investigate specific mechanisms for this transmission.

Of particular interest would be factors relating to maternal victimization, including data on mothers' family of origin and her choice of romantic partners. For example, in the current study, mothers who were sexually victimized in childhood were more likely to be involved in violent relationships, which are often associated with increased substance use among both victims (McNutt, Carlson, Persaud, & Postmus, 2002) and batterers (Brookoff, O'Brien, Cook, Thompson, & Williams, 1997), and with coercive and punitive parenting (Rumm et al., 2000). In fact, in a previous paper based on the present sample, the authors suggest that marital violence is a proxy for male substance use (McCloskey & Stuewig, unpublished manuscript). Variables relating to the substance use and parenting practices of these women's partners might illuminate the transfer of risk to their daughters. On the other hand, research on the intergenerational transmission of health risk behavior (smoking, lack of exercise, etc.) suggests that parental influence follows gender lines, with sons' behavior mirroring that of their father and daughters' behavior that of their mother (Wickrama et al., 1999). Additionally, in low-income samples such as this one, mothers may be the most stable parenting influence on children; high rates of single parenthood and male partner turnover mean that men are either not present or are present for only a portion of children's lives.

Findings from this study and others suggest that childhood sexual abuse sets girls on course for multiple forms of victimization and associated problems with functioning across the lifespan. That this victimization may echo across generations is tragic.

Research aimed at understanding the mechanisms involved in the intergenerational transmission of victimization is badly needed. Likely mechanisms include individual, family, and cultural values supporting the exploitation of girls and women. As is exemplified in a case study of 4 generations of women in New York, family culture surrounding the roles of women and the acceptability of interpersonal and sexual violence can show remarkable stability across time (Dunlap et al., 2002). When exploitive familial culture is echoed in or reinforced by cultures in larger social systems as well, the outlook for children of victimized women seems grim.

This study also provides information relevant to the third goal of identifying pathways from sexual abuse to substance use among girls. Early pubertal timing was related to sexual abuse in this sample, but it did not mediate the relationship between childhood sexual victimization and adolescent substance use. Although sexual abuse was unrelated to indicators of pubertal timing using univariate methods, SEM revealed a significant relationship between sexual abuse severity and a latent factor representing self-reported pubertal timing. The discrepancy between univariate and multivariate results is likely due to the more sensitive measurement provided by combining indicator variables to create a latent construct. The use of multiple measures of a single latent construct allows for more accurate estimates of true scores (Sechrest, personal communication). The finding that childhood sexual abuse predicts self-reported pubertal timing is consistent with theory presented by Trickett & Putnam (1993) and Belsky and colleagues (Belsky et al., 1992). It must be emphasized, however, that the current measure of pubertal timing consisted of self-reported estimates of timing relative to peers

and self-reported age at menarche, which may be less accurate than other methods of determining biological maturity (i.e., Tanner stages, physician ratings). Furthermore, age at menarche did not load highly on the pubertal timing factor. This lack synchrony may be due to several things, including the method of missing data imputation employed here or inaccuracy of reporting due to memory problems. Still, the empirical test of these theories provided by this study is an important contribution to existing knowledge, because data regarding the relationship between sexual abuse and pubertal timing are virtually non-existent.

The finding that pubertal timing was not related to substance use is inconsistent with existing literature linking early puberty and problem behavior among girls (e.g., Lanza & Collins, 2002; Magnusson et al., 1985). This discrepancy may be the result of differences in the measurement of pubertal timing between this study and others. In existing research, age at menarche and Tanner stages are the most common measures of pubertal timing, whereas self-reported perceptions about timing were used here. As noted above, these self-reports may be less accurate than traditional measures. In addition, 16% of girls in the sample had not yet reached menarche at Wave 2 or were missing data on menarche. It may be that the method of missing data imputation affected results. Finally, the outcome here was uniquely substance use, which does not perfectly correspond to other problem behaviors such as arrests or delinquency. The present study provides preliminary evidence that childhood sexual abuse is related to pubertal timing among girls, but the lack of relationship between early puberty and substance use reported here should be viewed with caution.

The observed pattern of association was similar when depression/low self-worth was tested as a mediator. Childhood sexual abuse was associated with more negative self-concept. Findings are consistent with Harter's (1999) conception of a depression/adjustment composite that combines depression, low global self-worth, and hopelessness into a single latent construct. They are also in line with the body of research linking childhood sexual abuse with low self-esteem (e.g., Bolger et al., 1998; Feiring et al., 1999) and depression and suicidality (e.g., Koss et al., in press). Yet, self-concept was not related to substance use among girls. Therefore, depressive self-concept did not mediate the relationship between sexual abuse and adolescent substance use.

The current results, however, are not consonant with existing data linking low self-esteem and substance use (Jessor et al., 1995; Neumark-Sztainer et al., 1997). Nor do they replicate results reported by Dembo and colleagues (Dembo et al., 1989) suggesting that low global self-worth mediates the relationship between childhood sexual and physical abuse and substance use. Several explanations for these discrepancies exist. Hussong and Chassin (1994), in a study testing the "stress-negative affect model of adolescent alcohol use" (p.707) found that depression was the sole aspect of negative affect (typically combining anger, anxiety, and depression) that mediated the effects of stress on substance use. Thus, one possibility is that a measure of depression alone, as opposed to the depressive self-concept construct used here, would show the expected association with substance use. Alternatively, the measure of depression used here may have been too time-specific to explain substance use behavior, as it provided only a snapshot of depressive symptoms during a single week. Finally, Dembo and colleagues

used a cross sectional design, a uni-dimensional measure of self-esteem, and data from adolescents in detention centers (Dembo et al., 1989). These differences in measurement and design may explain the differences in findings. Additional research is necessary to determine what role depression and low self-esteem may play in linking sexual abuse and later substance use. It does seem clear, however, that childhood sexual abuse carries negative consequences in terms of the development of a positive self-concept among girls.

Consistent with expectations and with literature reviewed above, behavioral under-control emerged as a unitary factor that mediated the relationship between childhood sexual victimization and adolescent substance use. This implies that interventions aimed at strengthening behavioral self-regulation may be helpful to both victims of sexual abuse and to other adolescents at risk for substance use. Future research should incorporate existing data about other important contributors to adolescent substance use, including peer variables, parental monitoring, cultural norms and legal statutes, and patterns of substance use among other family members (not just mothers; Hawkins et al., 1992) to allow for a more complete understanding of the complex processes that lead to substance use among adolescent girls.

Along these lines, results of the current study reveal that depressive self-concept mediated the relationship between childhood sexual abuse and behavioral under-control in the present sample. In fact, the observed parameter estimate (.69) indicates a substantial relationship between depressive self-concept and behavioral under-control. This finding is consistent with other studies showing a relationship between internalizing

and externalizing symptoms with regard to substance use (Mezzich et al., 1997). It also compliments emerging research suggesting that low serotonin may reflect a common biological substrate underlying aggression, impulsivity, and depression (Brodsky et al., 2001; Schatzberg, 2002). Future research replicating this mediational relationship is needed. Of particular interest would be studies aimed at disentangling the roles of genetic versus environmental mechanisms in the etiology of aggression, impulsivity, and depression and at exploring the interaction of these two sources of risk.

The close relationship between internalizing (depressive) and externalizing (aggressive) responses to sexual abuse found here is perhaps contrary to the typical conception of the effects of sexual abuse. As noted earlier, the majority of research on the effects of sexual abuse has focused on depression and PTSD (Koss et al., in press). The results of this study, however, suggest that the dominant conception of responses to sexual victimization may not capture the full range of girls' experience in the aftermath of abuse. The association between depressive self-concept and behavioral under-control in the present study suggests that depression and devaluation of the self related to sexual abuse may be a source of anger and acting out among victims. In this sample, higher levels of aggression, impulsivity, and risk-seeking among sexually abused girls suggest that they may be experiencing anger that is targeted both against others and against the self. Additional research is necessary to gain a more complete picture of adolescent girls' response to sexual victimization.

APPENDIX A

The questions to the mothers were:

Wave 1) "Do you have any reason to believe, or have any of your children ever complained that he [mother's current partner] has had sexual contact with them?", and "Do you have any reason to believe, or have any of your children ever complained of any adult outside the family ever sexually contacting them?" Wave 2) "Did you ever think during or before this time period [1990-1991] that he [mother's partner in 1990-1991] had any sexual contact with any of the children?", "Did you ever have reason to believe during or before this time period [1990-1991] that anyone had sexual contact or was sexually inappropriate with any of the children?", and "Since this time period – in the last 5-6 years – do you have reason to believe that your child [target child] had any inappropriate sexual contact with someone at least 5 years older than she/he?".

The questions to the children were:

Wave 1) "How often has an older person touched you in ways that you didn't like, or hugged you too hard in private, or tried to touch you under your clothes?", and "Did anyone ever get on top of you or make you lie down so they could get on top of you?" Wave 2) "During the last year did you have any unwanted sexual experiences you didn't want to have?", "Before you were 13, did anyone try to make you touch a sexual part of their body or touch you in a private part of your body when you didn't want them to?", "Did anyone ever show you private parts of their body when you didn't want them to?", and "Did you ever have any (other) sexual experiences with someone who you didn't want to?".

APPENDIX B

Problem drinking questions administered to adolescents included:

In the past month…

1. when you did drink, how many drinks did you have on each occasion, on average?

   0 – none   **1** – one   **2** – 2 or 3   **3** – 4 to 6   **4** – 7 to 9   **5** – 10 to 12   **6** – more than 12

2. about how often did you have 5 or more drinks of beer, wine, or liquor on a single

   occasion? **0** – never **1** – once or twice **2** – once a week **3** – 2-3 days/week **4** – 4-6

   days/week   **5** – every day

In the past year, "How many times did you…

0 – Never   **1** – Once   **2** – Two times   **3** – Three or more times

3. drink more than you planned to?"

4. feel sick to your stomach after drinking?"

5. get talked into doing something you didn't want to do after drinking?"

6. have fights or conflicts with your friends because of drinking?"

7. have a friend of the same sex complain because of your drinking?"

8. have a friend of the opposite sex complain about your drinking?"

9. have someone you were dating complain about your drinking?"

10. get in trouble with your parents because of your drinking?"

11. get into trouble with teachers, school counselors, or the principal because of your

    drinking?"

12. get into trouble with the police because of your drinking?"

13. drive after drinking?"

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