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Mediating pathways explaining psychosocial functioning and revictimization as sequelae of parental violence among adolescent mothers

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Abstract

Adolescent mothers are at high risk for negative life events such as previous childhood physical abuse, impaired psychosocial functioning, and young adulthood revictimization. Yet, little is known about the potential pathways, and hence opportunities for intervention, in these events. This study used structural equation modeling to investigate mediators of the effects of parental child abuse on later psychosocial functioning and revictimization (in the form of intimate partner violence and sexual violence) among adolescent mothers using longitudinal data spanning 2.4 years. On psychological distress in the final time period, parental physical child abuse had an early and then maintained effect, but also effects mediated by earlier psychological distress and revictimization. Psychological distress rather than substance use appeared as the primary psychosocial factor mediating the effects of parental violence both on future distress and on revictimization. To prevent further psychosocial impairment and revictimization, these findings indicate the need for early intervention with adolescent mothers who come from abusive families and who display higher levels of psychological distress.

Keywords

Child abuse; domestic violence; depression; adolescent mothers; alcohol use; longitudinal research; structural equation modeling

Approximately 270,000 girls under the age of 18 become pregnant each year in the United States, and over half go on to give birth (Guttmacher Institute, 2006). Adolescent girls who are pregnant or parenting bear a disproportionate amount of negative life experiences. For example, they are more likely to have experienced childhood parental abuse (Hillis et al., 2004), and to be particularly vulnerable to multiple violent victimization experiences across the life course, including intimate partner violence (Roberts, Auinger, & Klein, 2005) and sexual assault (Collins, 1998). In addition, adolescent mothers in some circumstances may be subject to impaired psychosocial functioning, including problems such as depression, anxiety, and alcohol and drug use (Schmidt, Wiemann, Rickert, & Smith, 2006; Wiemann,

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Berenson, Wagner, & Landwehr, 1996; Zoccolillo, Meyers, & Assiter, 1997). Given the disproportionate risks for this population, but also the reality that many do not experience these problems (Oxford, Gilchrist, Gillmore, & Lohr, 2006), understanding the potential pathways creating and contributing to these risks offers prevention and intervention possibilities that can benefit young mothers and in so doing, their children.

Among females in general, abuse by a parent during childhood is known to set the stage for subsequent problems, as it is associated with increased risk for future physical and sexual victimization, substance abuse, and impaired psychosocial functioning (Logan, Walker, Cole, & Leukefeld, 2002; Marcenko, Kemp, & Larson, 2000; Widom & Hiller-Sturmhofel, 2001). Although these problems are known to often co-occur (Evans-Campbell, Lindhorst, Huang, & Walters, 2006; Finkelhor, Ormrod, & Turner, 2007; Stevens, Ruggiero, Kilpatrick, Resnick, & Saunders, 2005), they are frequently studied in isolation (Follette, Polusny, Bechtel, & Naugle, 1996), such as by examining substance abuse outcomes without also considering psychologically distressing conditions like depression. This tendency to investigate limited aspects of women's trauma experiences and their sequelae fails to specify relationships among events that may, in part, be the consequence of causal chains of incidents driven by earlier abuse experiences. Indeed, that different forms of victimization are inter-related may suggest some ordering of events, although it does not in itself provide information about how these experiences lead to or contribute to one another. Hence, little is known about what pathways may exist between victimization in one time period, and revictimization and psychosocial functioning in later years. Additionally, since not all people who experience childhood victimization go on to experience these later problems (Hillis et al., 2004), there is the question as to whether some sequence or ordering of events increases their likelihood.

The analyses presented here investigate potential pathways and mediators of the effects of parental child abuse on later psychosocial functioning and revictimization among a sample of adolescent mothers at high risk for these negative events. The hypothesized set of relationships guiding the analyses is shown in Figure 1. In this conceptualization, the experience of parental child abuse is expected to increase the risk for problems in psychosocial functioning, such as substance use and psychological distress. In turn, these psychosocial problems then set the stage for revictimization, which maintains or exacerbates psychosocial impairment. These ideas suggest mediating mechanisms in the relationship between parental violence and later psychosocial problems. Specifically, earlier psychosocial problems mediate the relationship between parental abuse and revictimization, and revictimization serves as a mediating mechanism between earlier and later psychosocial impairment. While this theory has not been previously tested, a number of findings from the literature, reviewed here, are consistent with these hypotheses.

Parental child abuse as a risk factor for psychosocial problems and revictimization

A handful of prospective studies have supported a link between child abuse and psychosocial problems, most commonly adult substance abuse (Widom & Hiller-Sturmhofel, 2001) and mental health symptoms (Boney-McCoy & Finkelhor, 1996). Longitudinal research conducted with older adolescents followed into their early twenties explored the relationship between childhood physical and sexual abuse, major depression, and alcohol abuse and dependence, finding that childhood abuse predicted both primary depression and later onset of alcohol abuse/dependence (Clark, De Bellis, Lynch, Cornelius, & Martin, 2003).

Additionally, victimization is not randomly distributed; once a woman has been victimized, whether in childhood or adulthood, her chances of being revictimized increase (Logan et al., 2002). Several studies of particular forms of childhood abuse have borne this out,

demonstrating that childhood experiences are associated with an increased risk for revictimization in adulthood (Boney-McCoy & Finkelhor, 1995; Collins, 1998; Follette et al., 1996; Stermac, Reist, Addison, & Miller, 2002). Two population-based studies have found that early childhood abuse was associated with increased risk of sexual victimization in adulthood (Casey & Nurius, 2005) and increased exposure to intimate partner violence (Bensley, Van Eenwyk, & Simmons, 2003).

Potential explanatory mechanisms linking parental child abuse to revictimization

Although many studies are cross-sectional in design, research on the consequences of victimization suggests that impaired psychosocial functioning may be a pathway through which childhood abuse experiences increase the vulnerability to revictimization in adulthood. For instance, women who experience revictimization differ from non-victims in terms of their symptoms of depression and anxiety (Bensley et al., 2003; Boney-McCoy & Finkelhor, 1996; Casey & Nurius, 2005; Howard & Wang, 2003; Kilpatrick et al., 2003) and substance use (Casey & Nurius, 2005; Kilpatrick et al., 2003).

Research and theory on adulthood revictimization has focused most often on substance use, and the ways that it increases the risk for sexual assault and intimate partner violence. As reviewed by Logan et al., several studies have shown that the use of alcohol or other drugs is associated with revictimization (Logan et al., 2002). Logan et al. (2002) postulate that patterns of heavy use may lead to associations with persons more likely to commit either sexual assault or intimate partner violence, and also that substance use may impair reasoning and decision-making leading to increased vulnerability for assault. While this body of research supports the idea that substance use may precede revictimization, little research has yet evaluated whether substance use actually mediates the more distal influence of childhood abuse on revictimization; in other words, whether experiencing child abuse increases alcohol or drug use which then leads to adulthood revictimization. Further, little research has looked at these pathways simultaneously taking into account and controlling for the potentially related construct of psychological distress, using prospective data.

Effect of revictimization on subsequent psychosocial functioning

There is evidence that temporal ordering exists in which adolescent and adult victimization leads to greater mental health and substance use problems. A body of literature documents the deleterious effects of intimate partner violence on women's mental health (Bensley et al., 2003; Follette et al., 1996; Zlotnick, Johnson, & Kohn, 2006). For example, the National Survey of Adolescents found that sexual or physical assault was associated with both substance abuse and substance dependence (Kilpatrick et al., 2003). Golding (1999), in a review of the mental health problems experienced by women with a history of intimate partner violence, found a mean rate of alcohol abuse of 18.5% and a rate of 8.9% for drug abuse, both of which are substantially higher than the lifetime prevalence estimates for the population of the United States (Grant et al., 2004; Warner et al., 1995). Among adolescent girls who report dating violence, rates of alcohol and drug use also are substantially higher than among their non-abused counterparts (Howard & Wang, 2003; Wiemann et al., 1996).

Despite such strong findings, there is more to be known about the developmental pathways that link adulthood victimization to subsequent psychosocial functioning. For example, it is important to understand whether revictimization increases poor psychosocial functioning or whether the process more accurately reflects a continuation of pre-existing mental health or substance use disorders. Moreover, a key question is whether adult psychosocial functioning is an outgrowth of earlier parental child abuse, being the result of and maintained by a series of related mediating experiences such as those depicted in Figure 1.

Purpose of the Study

In summary, evidence clearly suggests that women's experience of early parental child abuse increases risk for mental health and substance use problems in young adulthood. Mechanisms explaining this relationship may occur in the ways in which child abuse leads to later revictimization, which then increases the probability of adulthood psychological distress and substance abuse. Previous research has assessed associations between these constructs, but has not typically done so in a comprehensive way, with longitudinally collected data, and guided by an overarching conceptual model. As a consequence, the question of whether the theorized mechanisms can be expected to fully mediate the effect of earlier experiences on later ones, or whether other factors play a role has yet to be determined.

To assess the theory displayed in Figure 1, a model was developed testing whether parental physical child abuse impairs women's psychosocial functioning (increasing their levels of psychological distress, and alcohol and marijuana use) which subsequently increases their risk for revictimization (intimate partner violence and sexual assault) in early adulthood. The model also tested whether experiences of adulthood revictimization increase subsequent psychological distress and substance use, above and beyond the pre-existing level.

Method

Participants and Procedure

This study is a secondary analysis of data obtained from study participants who were unmarried pregnant adolescents, age 17 years and younger, and who planned to carry their babies to term. Participants were recruited for a longitudinal study from public and private hospital prenatal clinics, public school alternative programs, and social service agencies in three urban counties surrounding a Northwestern metropolitan city. Parental or guardian consent was obtained for study participants who were not emancipated minors. Because by design participants were not recruited from mental health treatment, drug treatment, or juvenile justice agencies, this may be considered a more normative sample of pregnant adolescents who chose to keep their babies. Recruitment procedures included advertising, so a conventional overall response rate could not be calculated. However, approach and consent data were obtained at one of the participating agencies, a large county hospital prenatal clinic, and 76% of those eligible agreed to participate.

Enrollment included 240 pregnant adolescents who completed the initial interview between June 1988 and January 1990. Subsequent interviews were conducted at six month intervals from 6–18 months post-partum and 3.5 – 6 years post-partum, and at one year intervals from 9.5 – 11.5 years post-partum. For the purposes of this study, retrospective data are used from the first report the women made about their victimization histories, which occurred after they turned 18 years old, and five subsequent time periods measured every six months, for a total of 2.4 years from the initial victimization report. In total, 6 waves of data were used in these analyses. Retention rates for each wave of data range from 95.4% to 97.5% of the sample. The sample for the present analyses consisted of 229 (95.4%) of the original sample.

The study was conducted through in-person interviews; telephone interviews were conducted with participants who had moved out of the area, averaging 11% over time. Respondents were paid \$15 to \$50 for their participation during each wave of data collection. Respondents were assured of the confidentiality of their responses in the consent form, and by the interviewers at the more sensitive sections of the interview; they also were notified the project had a Certificate of Confidentiality from the federal government.

Measures

In order to address the issue of temporal sequencing of events, the measures of parental violence are taken from the respondents report when they had a mean age of 20.5 years ($SD = 1.03$). The first measures of psychological distress, alcohol use and marijuana use are from six months later (approximately 4 years post-partum). Revictimization was measured between the mean ages of 21.4 ($SD = 1.03$) and 22.4 ($SD = 1.04$) using three waves of data. The final outcome measures of psychological distress, alcohol and marijuana use were measured at mean age of 22.9 ($SD = 1.02$).

Outcome and Control Measures—Each of these measures was used at the final timepoint to assess levels of mental health functioning. The same measures were used as controls and were assessed at age 20.9, two years prior to the outcome measures.

Psychological distress: Psychological distress was measured using the depression and anxiety subscales from the Symptom Checklist (SCL) 90-R (Derogatis, 1994). The SCL-90 is a standardized instrument with demonstrated reliability and validity, and is designed to assess psychological functioning. Respondents were asked to indicate how often in the past week they were bothered or distressed by symptoms such as feeling hopeless about the future, or feeling nervous or shaky inside. Responses were scored on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). The mean scores on each subscale were used as indicators of the underlying construct of psychological distress.

Alcohol and marijuana use: The outcome measure for alcohol use had two components (Johnston, O'Malley, & Bachman, 1988). The first was a measure of frequency of alcohol use in the past month scored on a 6-point scale ranging from 0 (*never*) to 5 (*every day*). The second measure assessed the typical amount of alcohol used when the respondent drank. This scale ranged from 0 (less than 1 glass) to 4 (4 or more glasses at each occasion). The measure for marijuana use assessed the frequency of use in the past month, scored on the same 6-point scale as the frequency of alcohol use variable.

Predictor Variables

Physical child abuse (PCA): Once respondents turned 18 years old, they were asked to provide a retrospective assessment of their experiences with physical child abuse perpetrated by a parent or guardian. PCA was measured using a modification of the Conflict Tactics Scale (CTS) (Straus, 1979). The questions asked whether the respondent's parent or guardian threatened to hit or throw something at her; threw something at her; pushed, grabbed, shoved, or slapped her; hit her with a fist or object, kicked or bit her; beat her up; threatened her with a knife or gun; or used a knife or fired a gun at her. Responses were coded as "yes" or "no." The average number of "yes" responses was used in the analysis.

Adolescent exposure to intimate partner violence: Respondents were asked to report on their experiences of intimate partner violence (IPV) in the past six months at three waves of data collection. IPV was also measured using the Conflict Tactics Scale described above, with the perpetrator identified as the father of the respondent's baby, her husband, or any boyfriend or sexual partner. The mean number of "yes" responses was used in the analysis.

Sexual assault: This variable consists of the mean number of "yes" responses to four questions which ask whether, in the previous year, the respondent was forced to have sex because of psychological pressure, use of authority relationship, the threat of violence, or because she was physically forced to have sex (Boyer & Fine, 1992). This question was asked when the respondents were on average 22.4 years old, and was dichotomized as having experienced sexual assault (=1) or not (=0).

Analytic Strategy

The analytic strategy used in this paper is structural equation modeling (SEM). While SEM shares similarities with other linear models, such as multiple regression and factor analysis, SEM is more precise because it simultaneously accounts for estimated measurement error through the use of latent factors, allows for the specification of complex models that test a variety of relations among variables, and provides indices reflecting the fit of the overall model (Hoyle, 1995; Kline, 2005). This analysis began with the testing of the hypothesized measurement model, and then proceeded to the specification and testing of the structural model.

The structural model tested the relationships among the observed and latent variables and proceeded in a stepwise manner. First, a mediation-only model tested the relationships proposed in Figure 1. Parental childhood physical abuse was the exogenous variable, with pathways to psychological distress, alcohol use, and marijuana use. Paths from these three constructs were estimated to two types of revictimization, IPV and sexual assault. Paths were also included from revictimization to subsequent psychological distress, alcohol use, and marijuana use. Pathways from each of these psychosocial problems, earlier to later, were estimated to serve as controls, allowing for the examination of whether revictimization leads to problems in psychological distress and alcohol or drug use above and beyond previous levels. Disturbance terms -- the variance not accounted for by the predictor (Kline, 2005) -- were freely estimated for the three psychosocial problems at the earlier timepoint, given that it was expected that some variance would not be accounted for by parental abuse, and that this would be intercorrelated. Following estimation of this model, fit was examined and if it was not acceptable, then modifications to the model were made, one at a time, based on modification indices. All analyses were conducted using Mplus 5.0 (Muthén & Muthén, 2005). Although there was very little missing data, it was managed within the software's modeling framework which uses an EM algorithm for a maximum likelihood estimated covariance matrix that allows the inclusion of cases with some missing data (Little & Rubin, 2002). In this study, eleven cases were missing data on all variables and were excluded from the analyses.

The estimation procedure used was a weighted least squares parameter estimation that calculates robust standard errors, and a mean- and variance-adjusted chi-square test statistic (WLSMV, Muthén & Muthén, 1998). This method was appropriate in this case, in which there were ordinal measured latent construct indicators and outcomes, and the presence of some skewness and kurtosis on continuously measured variables (Kline, 2005). Fit was considered acceptable when the Comparative Fit Index (CFI) (Bentler, 1990) and the Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973) were at least .95, the Residual Mean Squared Error Approximation index (RMSEA) (Browne & Cudeck, 1993) was less than .06 (Yu, 2002), and the Weighted Root Mean Square Residual (WRMR) (Muthén & Muthén, 2005) was less than 1.0 (Yu, 2002). Fit based on Chi-square was considered acceptable if the Chi-square statistic was non-significant (Kline, 2005).

Results

Description of the Sample

The sample was young, multi-ethnic, and relatively low-income. Respondents ranged in age from 12 to 17 years ($M = 16.6$ years) at enrollment. However, variability in age was small; the majority ($n = 163, 69.1\%$) were in the relatively narrow age range of 16–17 with the remainder spread out among the younger ages. The ethnic make-up of the sample was representative of the ethnic makeup of adolescent mothers in Washington State at the time (Seattle – King County Department of Public Health: Epidemiology, Planning and

Evaluation Unit., 1996). The majority of respondents were European American (53%), followed by African American (28%), Native American (6%), Asian American (3%), and other races (10%); 8% reported Hispanic ethnicity. At six months postpartum, almost half of the respondents (47%) reported that their main source of income was public assistance (welfare).

Table 1 lists all the means, standard deviations and bivariate correlations of the model variables. Scores shown for abuse and violence variables reflect that over half (55.5%) of the respondents reported at least one experience of parental child abuse. Between the ages of 21.4 and 22.4, 47.9% reported having experienced some type of IPV and 9.9% reported experiencing a sexual assault in the previous year.

The sample appeared normative for alcohol use, depression, and anxiety, although they were higher than normal on marijuana use. For depression and anxiety, at the ages used in the analyses (early 20's), means shown in Table 1 for depression and anxiety were roughly midway between normative samples for non-patient adolescent females ($M = .95$ and $.74$, respectively; average age of 15.6) and non-patient adult females ($M = .46$ and $.37$, respectively; average age 46.0) (Derogatis, 1994). In terms of substance use, participants had similar rates of alcohol use compared to a nationally representative sample of women, but higher rates of marijuana use (Gillmore, Gilchrist, Lee, & Oxford, 2006). That being said, marijuana use was far from universal in the sample, with the majority (two-thirds) being non-users (hence, providing adequate representation of both users and non-users).

Measurement model

Overall, the measurement model fit the data well ($\chi^2_{df} = 27.91_{20}$, ns, CFI = .98, TLI = .98, RMSEA = .04, WRMR = .37) and did not require modification. In this model, all latent and single-indicator constructs were free to vary, and one indicator per latent construct was fixed to define the scales of the indicators (Brown, 2006). Standardized factor loadings for each latent variable from the confirmatory factor analysis (CFA) are shown in Table 2. The standardized factor loadings for each indicator of the latent constructs range from .77 to .92, all statistically significant.

Structural Model

Figure 2 shows the final structural model. The first model (a mediation only model) did not fit the data well ($\chi^2_{df} = 53.89_{25}$, $p < .001$; CFI = .93, TLI = .93, RMSEA = .07, WRMR = .65). Two modifications were made, one at a time, based on the modification indices until acceptable fit occurred ($\chi^2_{df} = 35.79_{24}$, ns; CFI = .97, TLI = .97, RMSEA = .05, WRMR = .52) in what was considered the final model. One modification involved freeing the disturbance terms between IPV and sexual violence ($r = .35$, $p < .01$). Contrary to the hypothesis that the effects of parental child abuse would be fully mediated through its effects on psychological distress and substance use, a direct relationship of physical child abuse to IPV was also required.

The final model accounted for 20.5% of the variance in intimate partner violence, 16.9% of the variance in sexual assault, and (at the final timepoint) 45.0% of the variance in psychological distress, 41.3% in alcohol use and 58.4% in marijuana use. As expected, each final outcome was moderately to strongly related with its earlier experience when the women were 20.9. These coefficients ranged from .40 for psychological distress to .76 for marijuana use, showing that earlier psychosocial problems did predict those later. In addition to these expected paths, the effects of psychological distress and marijuana use on the later outcomes were mediated through their relationship with IPV, but only psychological distress was mediated through sexual assault. Psychological distress increased

the risk of exposure to IPV and to sexual assault at the intermediary timepoints, as did marijuana use for IPV. Both IPV and sexual assault were associated with subsequent psychological distress. IPV was also associated with increased alcohol use at the final timepoint, but neither revictimization experience was associated with marijuana use.

Strength of mediated effects

Tables 3 and 4 show the strength and statistical significance of the mediated pathways in the model. A number of statistical trends ($p < .10$) were observed, and hence are interpreted here. Table 3 shows the direct and mediated effects of parental violence on revictimization. As can be seen, parental physical child abuse was directly (and most strongly) associated with IPV, and was also indirectly associated with IPV through its effect on women's level of psychological distress. Parental abuse had only an indirect effect on the experience of sexual assault, through its effect on psychological distress.

Table 4 splits the mediated effects on the final outcomes (psychological distress and substance use) into two kinds. One, labeled 'early and maintained' were effects in which parental violence affected psychological distress early on, an effect maintained directly from early to later timepoints. The other, labeled 'mediated via revictimization' were pathways in which either IPV or sexual assault mediated the effects of parental violence. As can be seen, parental physical child abuse had an early and maintained effect on the level of psychological distress the women experienced at age 22.9, and two mediated pathways, one through psychological distress and IPV, and one directly through IPV. The total indirect effects through these pathways were *standardized* $\beta = .14$, $p < .001$. Although parental physical child abuse was not correlated at the bivariate level with psychological distress at age 22.9, the structural model suggests that abuse had a continuing indirect effect on the level of emotional distress adolescent mothers experienced. Only one mediated pathway was seen for alcohol use at the final timepoint: parental abuse was associated indirectly with it via IPV; no mediated pathways were found for marijuana use.

Discussion

The study results were consistent with some, but not all of the hypotheses. Except in one notable case, the effects were mediated through the proposed mechanisms. The exception was the direct effect of parental child abuse on IPV, suggesting that factors outside the scope of the proposed model might better explain how such childhood experiences translate into risk for future partner violence. Otherwise, psychological distress rather than substance use appeared as the primary psychosocial factor mediating the effects of parental violence both on future distress and on revictimization. In other words, parental child abuse contributed to psychological distress several years later both by producing early and maintained distress, but also by increasing the experience of revictimization (most notably, IPV) which in turn led to future distress above and beyond that already experienced.

The strongest predictor of intimate partner violence was the direct effect of parental physical child abuse, suggesting an effect on revictimization for these early negative experiences with caregivers that was not present for sexual assault. Contradictory findings have been previously reported on the risk that child abuse poses for becoming a victim of intimate partner violence in adulthood. In a meta-analysis of the role of childhood abuse and other factors on experiencing intimate partner violence, Stith et al. (2000) found a small effect of parental abuse on risk for subsequent IPV victimization, particularly for women. However, in a recent prospective study, child abuse was not a significant factor in predicting revictimization (Ehrensaft et al., 2003). Our findings suggest that, at least within the high risk sub-population of adolescent mothers, physical abuse by parents does create risk for becoming a victim of IPV in young adulthood. Further research might profitably focus on

the additional explanatory pathways, above and beyond psychosocial distress and substance use, explaining this. For instance, childhood physical abuse may change levels of educational attainment or social support, which have been associated with intimate partner violence in previous studies (Dutton 1992; Kyriacou et al., 1999).

While parental violence increased psychological distress as expected, it did not significantly affect alcohol or marijuana use. In other words, there was no difference in the use of alcohol or marijuana between those adolescent mothers who had experienced physical child abuse and those who had not. Additionally, and contrary to previous findings, alcohol use was not associated with either form of revictimization studied here. However, once revictimization occurred (either through intimate partner violence or sexual assault), this was associated with an increased use of alcohol, even after controlling for previous levels. Interestingly, although alcohol use was not associated with an increased risk of victimization, marijuana use was predictive of experiencing intimate partner violence; but neither form of revictimization was associated with subsequent marijuana use.

Although the association between victimization and subsequent psychological distress has been well-documented (Golding, 1999) and confirmed again in this study, less is known about the ways in which increased levels of depression and anxiety create risk for revictimization. The link found here between earlier levels of psychological distress and revictimization are in contrast to a study that found no relationship between pre-existing mental disorders and domestic violence among a representative sample of women in the National Comorbidity Study of mental illness (Kessler, Molnar, Feurer, & Appelbaum, 2001). The difference in study findings may be explained by the longitudinal nature of the data analyzed here, differing forms of measurement, or by the fact that adolescent mothers represent a sub-population in which a relationship exists between previous levels of psychological distress and subsequent revictimization.

Evidence from the sexual assault literature suggests that increased psychological distress may create risk for revictimization through both intrapersonal and contextual factors (Messman-Moore & Long, 2002). As an example, women who have been victimized as children may experience feelings of low self-worth which may impair decision-making about a relationship (Sandberg, Matorin & Lynn, 1999), or prevent women from ending a violent relationship. Psychological distress may also change a woman's social context. For instance, feelings of depression are associated with social withdrawal (Sotsky, et al., 2006) which may limit women's social networks, affecting their access to both material and emotional resources that would bolster healthy relationships.

The timing of the antecedents and consequences of victimization, and the victimization itself is difficult to study because of the interrelatedness of these experiences (i.e., psychological distress being associated with increased risk of victimization, which subsequently increases levels of psychological distress), and the timing of the data collection in any particular research study. Ideally, a study would have ongoing measures of victimization and psychosocial impairment in order to establish the time-ordering of the events. For example, among these adolescent mothers, it is possible that many experienced IPV or sexual assault before, during and after their pregnancy; unfortunately this study was unable to measure these experiences with that specificity. Nevertheless, one contribution of this research is to show an element of the time ordering of these experiences, namely that victimization increased adult psychosocial impairment above and beyond the level of pre-existing psychological distress and alcohol use.

Intervention Implications

Given that almost 150,000 births each year are to adolescent women under the age of 18 (Guttmacher, 2006), these findings indicate important opportunities for intervention with this high risk group. For adolescent mothers, the findings point to the importance of assessment, resources, and availability of intervention, both to treat the consequences of victimization over time in individuals' lives, and to prevent further negative events once abuse has occurred.

Adolescent mothers with histories of childhood trauma may need unique supports to reduce their vulnerability to revictimization, and pre-natal and well-baby services may be a place where these services (or referrals to them) can begin. For example, adolescent mothers should be assessed for the presence of parental child abuse early in their pregnancies. Those mothers that indicate a history of abuse should be considered at increased risk for future victimization and psychological distress, and offered mental health services or at the very least counseled on the dynamics related to intimate partner violence and sexual assault. IPV services should be routinely made available to adolescent mothers, even after the child is born, as this study shows that nearly half of the sample mothers experienced IPV in the years after the birth. Persons who work with adolescent mothers should be prepared to discuss safety planning (Davies & Lyons, 1998), and optimally, to provide contextualized assessment of their safety and well-being needs (Lindhorst, Nurius, & Macy, 2005).

The "circularity" observed for psychological distress and IPV--that one leads to the other which then enhances the former--also has intervention implications. These implications are most clearly applicable to adolescent mothers, but since this sample appears normative in levels of psychological distress and alcohol use, as well as had sufficient variability in marijuana use, these findings may similarly apply to the broader population of adolescent women. The findings indicate that early assessment and treatment for depression and anxiety may be helpful, as these symptoms can lead to chronic patterns of psychosocial impairment, as well as increasing risk for victimization. Once victimization has occurred, services may be most helpful to prevent further decompensation, particularly increased alcohol use. Alcohol use assessment, especially as it may be used to cope with the consequences of abusive relationships, should be integrated into care settings. Mental health intervention service providers have the opportunity to talk with young women about healthy relationship development, and indicators of potentially abusive behaviors in intimate partnerships.

Research Implications

The fact that physical child abuse (PCA) sometimes co-occurs with childhood sexual abuse (CSA) (Edwards, Holden, Felitti, & Anda, 2003) raises the possibility that the effects seen in these analyses are at least partly due to CSA experiences. Future research could profitably include CSA along with PCA in similar analyses to partial the effects of each, above and beyond the other. This was not possible with the data analyzed here since CSA was not measured. Although many studies examine either CSA or PCA, but not both, there is research literature suggesting that in a combined analysis each type of abuse would have independent as well as additive effects. For example, researchers have found that PCA and CSA each have independent effects on various negative outcomes, including mental health and adulthood revictimization, with the following differences in findings across studies: that the effects are fairly equivalent (Bonomi et al., 2008; Edwards, Holden, Felitti, & Anda, 2003; Mullen et al., 1996); that CSA's effects are stronger than PCA's (Fergusson, Boden, & Horwood, 2008); and that PCA's are stronger than CSA's (Schaaf & McCanne, 1998). There also are fairly consistent findings across these studies that there is a 'dose-response' effect such that experiencing both PCA and CSA increases negative outcomes above and beyond experiencing either one alone. Hence, it is reasonable to hypothesize that in analyses

like those presented here, CSA and PCA would have effects that are independent (experiencing either alone would have negative consequences) and additive (experiencing both would result in even more severe consequences). Of further interest would be whether CSA would add additional pathways, especially to and through adulthood sexual assault, although it should be noted that even with sexual assault there is evidence that the effects of PCA rivals that of CSA (Schaaf & McCanne, 1998).

An additional area for further research would be to test the generalizability of these findings to non-pregnant adolescents; as well as to pregnant and non-pregnant women at other ages. Differences in the characteristics of subgroups may lead to different results. For example, very young adolescent mothers have worse health outcomes than older mothers (Leland, Petersen, Braddock & Alexander, 1995); the sparse distribution of very young mothers in this dataset prevented us from testing whether they would show different pathways from PCA to psychological impairment and revictimization. Additionally, the use of alcohol and other drugs also increases during adolescence (Monti, Colby, & O'Leary, 2004), so its role as a potential mediator of further victimization may shift as girls age, both for pregnant and non-pregnant individuals.

Strengths and Limitations

This study has a number of strengths that expand on previous research. First, it benefits from longitudinal data allowing for analyses of emerging processes over time, increasing our understanding of developmental pathways that may contribute to increased risk or resilience. Secondly, the study uses multiple, sophisticated measures of violence exposure and mental health, factors that increase the validity of the findings.

In addition to these strengths, several caveats should be kept in mind when considering these results. First, the findings are based on the particular high risk sub-population of adolescent mothers; whether they are more generally applicable would need testing with other samples. Second, while the results are strengthened by the use of longitudinal data, and especially with the inclusion of pathways controlling for earlier experiences' effect on those later, causal interpretations must be made cautiously and would benefit from replication. Third, the sample was drawn from a single geographic area of the United States. Although the sample appears representative of teenagers who gave birth in the study region, it is unknown to what extent the findings generalize to other regions of the U.S. Finally, the data are based on self-report and may be subject to some error; for example, intimate partner violence (or other events) may be underreported.

Conclusion

Findings from this study indicate that adolescent mothers are at risk of a range of victimization experiences, which can result in subsequent revictimization that further contributes to psychosocial impairment. Services to adolescent mothers may be maximally helpful if they address the co-occurrence of these experiences over the life course of young mothers. As these young women and their children are particularly vulnerable to interpersonal victimization and an intricate web of interrelated problems, an integrated approach to health and wellness for young mothers and their children may be necessary to improve the safety and well-being of these families.

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Figure 1.
Proposed conceptual model.

Figure 2.
Standardized coefficients from structural model ($N = 229$).

Table 1

Means, standard deviations, and bivariate Spearman correlations, $N = 229$

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Physical child abuse	--	.21**	.12	.11	.16*	.05	.12	-.02	.21**	.18**	.18**	.10	.02
2. Intimate partner violence		--	.29**	.31**	.33**	.24**	.20**	.22**	.30**	.31**	.31**	.30**	.20**
3. Sexual assault			--	.18**	.14*	.07	.14*	.06	.25**	.28**	.11	.18**	.15
4. Depression ¹				--	.67**	.22**	.22**	.13	.47**	.34**	.13	.17*	.16*
5. Anxiety ¹					--	.13	.25**	.18**	.41**	.44**	.03	.14*	.15*
6. Frequency of alcohol use ¹						--	.57**	.35**	.21**	.11	.09*	.33**	.18**
7. Amount of alcohol used ¹							--	.25**	.25**	.16*	.26**	.35**	.13
8. Frequency marijuana use ¹								--	.15*	.17*	.18**	.17*	.56**
9. Depression ²									--	.69**	.17**	.28**	.19**
10. Anxiety ²										--	.17*	.20**	.17*
11. Frequency of alcohol use ²											--	.53**	.27**
12. Amount of alcohol used ²												--	.28**
13. Frequency marijuana use ²													--
Mean (SD)	1.44 (1.68)	1.96 (2.91)	0.10 (0.30)	0.64 (0.65)	0.59 (0.65)	0.74 (1.09)	2.36 (1.85)	0.37 (0.95)	0.67 (0.75)	0.67 (0.76)	2.05 (1.05)	2.39 (1.88)	0.41 (1.04)

NOTE:

* = $p < .05$,

** = $p < .01$ (two-tailed tests).

¹ Mean age = 20.9

² Mean age = 22.9

Table 2

Standardized Factor Loadings for Latent Variables

Indicator Variable	Age	
	20.9	22.9
Psychological Distress		
Depression	.86	.92
Anxiety	.82	.80
Alcohol Use		
Frequency of use	.89	.79
Amount used	.77	.82

Note: $p < .01$ for all loadings.

Table 3

Standardized estimates of direct and meditational (indirect) pathways of parental violence (PV) to intimate partner violence (IPV) and sexual assault (SA)

Outcome	Path	Effects	
		Direct	Mediated by distress
Intimate partner violence	PV → IPV	.24***	
	PV → Psychological Distress → IPV		.04*
Sexual assault	PV → Psychological Distress → SA		.05 ⁺

⁺ $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 4

Standardized estimates of meditational (indirect) pathways of parental violence (PV) to psychological distress (PD) and alcohol use (AU)

Outcome	Path	Effects	
		Early & maintained	Mediated via revictimization
Psychological distress	PV → PD → PD	.08 [*]	
	PV → IPV → PD		.05 [*]
	PV → PD → IPV → PD		.01 ⁺
	PV → PD → SA → PD		.01
Alcohol use	PV → IPV → AU		.05 ⁺
	PV → PD → IPV → AU		.01

⁺ $p < .10$,

^{*} $p < .05$,

^{**} $p < .01$,

^{***} $p < .001$

IPV = Intimate partner violence