



Published in final edited form as:

Child Maltreat. 2015 February ; 20(1): 50–60. doi:10.1177/1077559514548701.

Adolescent Maltreatment in the Child Welfare System and Developmental Patterns of Sexual Risk Behaviors

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Abstract

In this longitudinal study, we tested whether adolescent maltreatment and out-of-home placement as a response to maltreatment altered developmental patterns of sexual risk behaviors in a nationally representative sample of youth involved in the child welfare system. Participants included adolescents aged 13 to 17 ($M=15.5$, $SD=1.49$) at baseline ($n=714$), followed over 18 months. Computer-assisted interviews were used to collect self-reported sexual practices and experiences of physical and psychological abuse at both time points. Latent transition analyses were used to identify three patterns of sexual risk behaviors: abstainers, safe sex with multiple partners, and unsafe sex with multiple partners. Most adolescents transitioned to safer sexual behavior patterns over time. Adolescents exhibiting the riskiest sexual practices at baseline were most likely to report subsequent abuse and less likely to be placed into out-of-home care. Findings provide a more nuanced understanding of sexual risk among child welfare-involved adolescents and inform practices to promote positive transitions within the system.

Keywords

child maltreatment; child welfare; adolescent; sexual risk behavior; longitudinal

Adolescents involved in the child welfare system have exhibited higher rates of risky sexual behavior compared to other teens, such as increased rates of sexually transmitted infection and pregnancy (Courtney, Terao, & Bost, 2004; Leslie et al., 2010). Evidence has suggested sexual health disparities continue over time and into the transition to adulthood with long-term health consequences (Ahrens et al., 2010; Carpenter, Clyman, Davidson, & Steiner, 2001; Courtney et al., 2011). Less research has investigated changes in sexual behaviors

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

among child welfare–involved youth across time, and few studies have examined risk and protective factors associated with long-term sexual health (Dworsky & Courtney, 2010; James, Montgomery, Leslie, & Zhang, 2009; Jones et al., 2010). Person-centered analyses that capture sexual risk behavior profiles among adolescents in the general population have provided a conceptual and methodological framework to examine youth at risk for abuse (Lanza & Collins, 2008). In this study, we aimed to better understand the dynamics of sexual risk behaviors among a nationally representative sample of teens who were the subject of child protective services investigation.

Child Welfare Involvement and Sexual Risk Behavior

A growing body of research has demonstrated a link between child welfare involvement and sexual risk. Studies have consistently demonstrated high rates of unplanned pregnancy and exposure to HIV and other sexually transmitted infections (STIs) among adolescents placed in out-of-home settings (Courtney et al., 2004; Polit, White, & Morton, 1990; Risley-Curtiss, 1997). Findings from a nationally representative study of 993 youth investigated by child protective services between 1999 and 2000 found more than 25% of youth aged 11 to 15 were sexually active, and rates increased with age (Leslie et al., 2010). Among 15-year-olds, 59% had sexual relations and 19% of these youth had been pregnant or impregnated someone. In a study of 732 adolescents aged 17 to 18 preparing to exit the foster care system in three Midwestern states, Courtney, Terao, and Bost (2004) found one third of female respondents had a history of pregnancy and 68% of these pregnancies were described as unplanned.

Retrospective and prospective population-based studies have indicated elevated sexual risk among child welfare–involved youth endured into adulthood. A nationally representative study of 9,620 women aged 15 to 44 found those who reported a history of child welfare involvement had more sexual partners and were younger at first pregnancy compared to women who reported no child welfare history (Carpenter et al., 2001). In addition, findings from the National Longitudinal Study of Adolescent Health (AddHealth)—a nationally representative study of 14,332 adolescents in Grades 7 through 12 during the 1994 to 1995 school year—suggested youth who lived in foster care in adolescence exhibited significantly higher rates of laboratory-diagnosed STIs in young adulthood (Ahrens et al., 2010).

Courtney et al. (2004); Courtney et al. (2007); Courtney, Dworsky, Less, and Raap. (2010); and Courtney et al. (2011) followed youth after exiting foster care in three Midwestern states at ages 21, 23 to 24, and 26 years and compared sexual health to same-age peers from the AddHealth longitudinal study. At age 21, male respondents with child welfare contact were more likely to have been paid for sex, more likely to have impregnated someone, and less likely to have used birth control consistently compared to AddHealth males (Courtney et al., 2007). Likewise, young women exposed to child welfare exhibited significantly higher rates of pregnancy and lower likelihood of consistent condom or birth control use, were more likely to have had contact with a partner with a known STI, and were more likely to have had sex for money (Courtney et al., 2007). At ages 23 to 24, both male and female respondents continued to demonstrate lower rates of consistent birth control use compared to the general population (Courtney, Dworsky, Lee, & Raap, 2010). At age 26, both male and

female respondents reported greater likelihood of having contracted an STI than did peers in the AddHealth study (Courtney et al., 2011). In addition, among those female respondents who had been pregnant, the young women with child welfare contact were less likely than same-age peers in the AddHealth study to have desired their pregnancy.

These studies demonstrate significant disparities in sexual health among youth involved in the child welfare system that continued over time. Less research has identified risk and protective factors that influence sexual health outcomes. Dworsky and Courtney (2010) found that continued placement in out-of-home settings reduced risk of pregnancy from age 17 to age 19 among females aging out of foster care. Although not tested, out-of-home placement may have protected youth from subsequent maltreatment and provided opportunities to connect with needed services. James, Montgomery, Leslie, and Zhang (2009) found out-of-home placement and caregiver physical abuse unrelated to condom use or pregnancy 36 months after investigation in a national study of 877 youth in contact with child welfare; yet, being older, being Hispanic, and reporting greater rates of delinquency and deviant peers predicted adolescent pregnancy at follow-up.

In contrast, findings from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN)—a study that followed 1,354 children who were the subjects of maltreatment investigations at age 4—suggested that repeated exposure to psychological abuse, physical abuse, and child sexual abuse in childhood increased the risk of early sexual activity at age 14 (Jones et al., 2010). This corresponded with other research that demonstrated a link between child abuse and subsequent sexual risk (Black et al., 2009; Kaestle, 2012; Noll, Trickett, & Putnam, 2003).

Person-Centered Analyses of Sexual Risk Behaviors and Maltreatment

Research on sexual risk among at-risk adolescents has focused on single time point assessments that describe the overall population, such as percentage with STIs, average number of partners, or number of risk behaviors. However, some evidence has suggested that meaningful variation exists across sexual risks that distinguish subgroups of youth (Connell, Gilreath, & Hansen, 2009; Haydon, Hussey, & Halpern, 2011). Person-centered analyses have provided a method to test the assumption that sexual risk reflects a single dimension. Lanza and Collins (2008) extended this approach to test whether discrete change occurs across subpopulations over time.

Using data from the National Longitudinal Survey of Youth 1997 (NLSY97), Lanza and Collins (2008) modeled changes in categorical sexual risk behavior in the transition from adolescent to young adulthood. In 1998, youth aged 17 or 18 ($n = 2,937$) were assessed and followed again in 1999 and 2000. Latent transition analysis across three time points suggested subgroups emerged across indicators of dating status, number of sexual partners, and use of condoms. In order of prevalence at first assessment, these included a subgroup that dated but did not have sex during the previous year (29%), a subgroup with multiple sexual partners but consistent condom use (23%), a subgroup that did not date nor have sex during the previous year (19%), a subgroup with multiple sexual partners and inconsistent condom use (18%), and a subgroup that had one dating partner with whom they were

monogamous (12%). Prevalence of latent transition statuses changed over time, such that monogamy (29%) and multiple partners with inconsistent condom use (25%) became most common at the third wave. In examining these risk groups, being in a monogamous relationship often coincided with less frequent condom use. They also found youth with multiple partners and infrequent condom use were less likely to change subgroups across time. If they did, these youth were likely to move into a monogamous relationship, which lessened their risk of STI exposure relative to their initial status.

This work emphasized sexual risk behavior as a multifaceted behavioral construct that qualitatively changes across adolescence and young adulthood, as well as provided meaningful information for preventive interventions to be tailored to specific profiles. Less research has examined how continued exposure to environmental risk factors, including child maltreatment, impacted developmental patterns of sexual risk behaviors.

Present Study

In this study, we tested whether continued maltreatment during adolescence compromised patterns of sexual behaviors over time and whether out-of-home placement into child welfare protected youth in this process. Data were used from a nationally representative sample of children who were the subject of child protective services investigation, including youth who remained in home after investigation and those placed into out-of-home care. Adolescents aged 13 to 17 at the time of investigation were followed prospectively over an 18-month period; this provided an opportunity to examine change in sexual risk as youth prepared for the transition to adulthood. Latent transition analyses captured patterns of youth-reported heterosexual risk behaviors over time. Analyses allowed empirical examination of subgroups in sexual practices that varied across assessments, reflecting prior research that suggested meaningful configurations of sexual behaviors in normative adolescent samples (Lanza & Collins, 2008).

Prior research has suggested abuse in adolescence, especially repeated abuse, threatens sexual health (Jones et al., 2010), while out-of-home placement may play a protective role (Dworsky & Courtney, 2010). In addition to maltreatment and out-of-home placement, theoretically relevant covariates were tested. These included risk factors for unhealthy sexual practices identified in other studies of youth at risk of adolescent maltreatment. These covariates were youth age, gender, race/ethnicity, substance abuse symptoms, delinquency, delinquent peer affiliation, and primary reason for investigation (Connell et al., 2009; James et al., 2009; Jones et al., 2010). Each has demonstrated unique contributions to elevated risk for sexual behaviors and thus was examined to accurately estimate developmental processes. The study addressed a dearth of research on the confluence of environmental risks associated with child welfare involvement including poverty, family dysfunction, and disrupted community connections that place youth at significant risk for maladaptive sexual development.

In this study, we investigated two sets of hypotheses. First, the study empirically tested the assumption that adolescents involved in the child welfare system exhibited a single developmental pattern of sexual risk behaviors across time. It was hypothesized that at least

two statuses would emerge representing stably low- and high-risk profiles, while at least one subgroup of youth would transition to lower risk patterns over time. Second, group membership would be predicted by adolescent maltreatment and child welfare experiences, after controlling for other identified risks for unsafe sexual behaviors. Further, it was hypothesized that repeated exposure to physical and psychological abuse in adolescence predicted membership into higher risk sexual risk patterns, as well as lower probability of transitioning to lower risk patterns over time. In addition, we hypothesized that youth placed into out-of-home care in response to adolescent maltreatment would experience more positive transitions over the follow-up period, marked by movement into lower risk subgroups over time. Analyses also tested whether other youth characteristics predicted latent status membership. It was assumed that riskier sexual behavior transitions would be more common among males, older adolescents, ethnic minorities, and sexual abuse allegations. Likewise, higher delinquency, deviant peer affiliation, and substance abuse were also predicted to convey greater risks.

Method

Participants

The sample for this study was drawn from Cohort 2 of the National Survey of Child and Adolescent Well-Being (NSCAW II). This nationally representative longitudinal survey assessed children from birth to 17 years of age who were the subject of child protective services investigation between February 2008 and May 2009 ($N = 5,873$). Baseline assessments occurred immediately after investigation with one follow-up 18 months later. This study included adolescents aged 13 to 17 years ($M = 15.5$ years, $SD = 1.49$) at baseline ($n = 714$). This comprised 160 youth who were 13 years (24.9%), 164 who were 14 years (22.6%), 166 who were 15 years (23.0%), 160 who were 16 years (19.3%), and 64 who were 17 years (10.2%).

The sample was evenly divided by gender with 58.7% female ($n = 415$). Racial and ethnic composition reflected disproportionate involvement with child welfare among minority families nationally; 46.2% were Caucasian ($n = 276$), 25.0% identified as Hispanic ($n = 174$), 18.7% were African American ($n = 182$), and 10.1% reported as “Other” ($n = 79$). The sample included youth who remained in home after investigation, as well as those placed into out-of-home care. At baseline, 17.9% ($n = 252$) of adolescents were removed from the home immediately following child protective services investigation, while an additional 10.0% experienced subsequent out-of-home placement between initial interview and follow-up.

Measures

Sexual risk behaviors—A study-derived instrument based on the sexual activity measure of the LONGSCAN was used to assess behaviors that risk sexually transmitted disease and unintended pregnancy. This instrument included 13 items measuring engagement in various sexual behaviors. Sexual risk items used for this study included whether adolescents had engaged in vaginal sexual intercourse in the past 12 months; whether a male condom was used during last intercourse; whether youth had been pregnant or impregnated someone; and

the number of sexual partners the adolescent reported in the 12 months prior to the interview. Number of partners was recoded as zero to one partner versus two or more partners based on variable distribution. The 4 selected items represented previously studied sexual risk behaviors that varied over time. Other items in the instrument represented probes for further information on these indicators (age at pregnancy and number of pregnancies) or inquired into static constructs that would not contribute to patterns of transition in risk behaviors over time (e.g., nonconsensual first sexual encounters and age at first sexual encounter). Unfortunately, the measure only assessed heterosexual sexual risk behaviors.

Adolescent maltreatment—Maltreatment represented indication of whether children were exposed to physical or psychological abuse at the time of initial investigation and during the follow-up period. Adolescents completed the Parent-Child Conflict Tactics Scale (PC-CTS) via audio computer-assisted self-interview at each interview (Strauss, Hamby, Finkelhor, Moore, & Runyan, 1998). Using an 8-point scale (1 time, 2 times, 3 to 5 times, 6 to 10 times, 11 to 20 times, more than 20 times, not in the past 12 months, and never), youth reported on the frequency and extent to which a parent carried out specific acts of physical and psychological aggression (Straus et al., 1998). In accordance with measure development as well as use with the NSCAW sample (Dowd et al., 2004; Strauss et al., 1998), any indication of psychological aggression, severe physical assault, or very severe physical assault in the past 12 months was coded as exposure to maltreatment. The PC-CTS measure has been extensively validated (Strauss et al., 1998) and internal consistency was good for the child report in the NSCAW. Cronbach's α for total score on the child was .97, with subscales ranging from .71 for nonviolent discipline to .97 for Total Physical Assault. For this study, continued exposure to maltreatment was captured by combining data at baseline and the follow-up interview. Maltreatment was categorized as not occurring, occurring at baseline only, occurring at follow-up only, or occurring at both times.

Abuse type—Child protective service caseworkers provided the most serious allegations of abuse and neglect that triggered investigation by the child welfare system. From 17 different types of abuse, this study categorized reasons for investigation into four types: physical abuse, sexual abuse, emotional abuse (i.e., emotional maltreatment, moral/legal maltreatment, educational maltreatment, and exploitation), and neglect (i.e., physical neglect, no supervision, and abandonment). Each category was dichotomized to compare the primary reason to other types of abuse. Alleged reports were used instead of substantiated cases, given evidence from the NSCAW study that suggested this differentiation failed to reflect elevated risk (Hussey et al., 2005; Kohl, Jonson-Reid, & Drake, 2009; Senn, Carey, & Vanable, 2008).

Out-of-home placement—This refers to whether adolescents had been placed in out-of-home care at the time of baseline interview or at any point in the 18-month follow-up period. Information on living arrangements was gathered from youth, caregivers, and child welfare caseworkers, including placement into formal and informal kinship care, foster care, group homes, and other out-of-home settings. Responses were dichotomized to indicate out-of-home placement versus no placement. If discrepancies existed between reporters, indication of out-of-home status was examined first from caregivers and then from adolescents or

caseworkers. In addition, discrepancies were resolved by examining relationship status between youth and caregivers, as well as household compositions of other youth in the home.

Demographics—Information on adolescent age, gender, and race and ethnicity was available from child welfare agencies as part of the sampling frame. When discrepancies emerged between this information and interview responses, sources from youth, caregivers, and caseworkers were triangulated to determine the most appropriate categorization. There were four race categories: non-Hispanic African American, non-Hispanic Caucasian, Hispanic, and non-Hispanic other that included American Indian/Alaskan Native, Asian/Native Hawaiian/Other Pacific Islander, and other. When more than one race was reported, the rarest race was assigned, based on 2000 U.S. Census data. Information was collapsed into a single race/ethnicity variable that included mutually exclusive categories of African American, Caucasian, Hispanic, or Other.

Substance abuse—Information on adolescent substance use at the baseline interview was gathered through the CRAFFT, a series of six questions developed to screen adolescents for high-risk alcohol and drug use simultaneously (Knight et al., 1999). Items assessed problem behaviors with alcohol and illicit substances. Each endorsed item was scored as 1 and the sum was used as a total substance abuse score. The measure has been extensively validated with adolescent populations (Knight, Sherritt, Gates, & Harris, 2004; Knight, Sherritt, Harris, Gates, & Chang, 2003; Knight, Sherritt, Shrier, Harris, & Chang, 2002) and shows strong internal consistency in the NSCAW sample (Cronbach's $\alpha = .82$).

Delinquency—Information on adolescents' delinquent behaviors at the baseline interview was assessed using the Self-Report of Delinquency (SRD), designed for use in the National Longitudinal Survey of Youth (Elliott & Ageton, 1980). A total of 72 questions asked about specific delinquent acts and the frequency (1 = *once* to 5 = *5 or more times*) in the past 6 months. The SRD has been used in a number of population-based studies of adolescents and demonstrates high internal consistency in the NSCAW sample (Cronbach's $\alpha = .98$).

Deviant peer association—Adolescents' levels of association with deviant peers at baseline were assessed via the deviant peer affiliation measure (Capaldi & Patterson, 1989). This 6-item measure asked youth to indicate how many of their friends (none, very few, some, most, and all) in the past year engaged in various delinquent acts, such as damaged property, stole, and cheated on school tests. Internal consistency in the NSCAW sample was $\alpha = .89$.

Procedures

The NSCAW II team utilized a stratified sampling strategy to ensure that families selected for the study represented the child welfare population based on age and level of service (i.e., child-in-home and not receiving services, child-in-home and receiving services, and child placed out-of-home). The study design oversampled groups of particular interest in order to ensure sufficient power for analyses. These groups included infants, sexually abused children, and children receiving ongoing services following investigation.

Baseline data collection was completed between April 2008 and December 2009 with children and adolescents, current caregivers, and child protective service caseworkers. Followup interviews with youth and caregivers were conducted 18 months later between October 2009 and January 2011. Child welfare workers were also interviewed if a case remained open. Data collection efforts for a third wave were underway during the write-up of this study; however, data had not been released to be included in these analyses. A full description of the sampling strategy and data collection can be found in the user's manual for NSCAW (Dowd et al., 2004).

Analytic Approach

Analyses identified patterns of risky sexual behavior and transition in patterns over time. The general approach examined sexual risk at baseline among the full sample of adolescents with available data ($n = 714$), while transitions in risk behaviors across time were studied with a subsample of youth followed 18 months later ($n = 573$). No significant differences existed between adolescents with missing ($n = 141$) and non-missing ($n = 573$) data on baseline sexual behaviors, as well as other youth characteristics including, age, gender, race/ethnicity, maltreatment exposure, out-of-home placement, substance abuse, delinquency, and deviant peer affiliation. The lack of data appeared to be unrelated to youth risk. All analyses were appropriately weighted for sampling characteristics and missing data (Dowd et al., 2004).

Analyses were conducted in a series of steps (Collins & Lanza, 2008). The first step—latent class analyses—conducted within time points investigated heterogeneity in patterns of sexual risk behaviors exhibited at baseline and 18-month follow-up. These behaviors included vaginal sex in the past 12 months, sex without a condom in the past 12 months, number of sexual partners in the past 12 months, and having been pregnant or impregnated someone. Analyses were conducted with the full sample ($n = 714$) to maximize available data for stable estimates of latent subgroups. Multiple indicators of model fit were used to examine the appropriateness of models to the data, as well as compare fit across solutions for one to five class models (Muthen, 2004). A χ^2 test was examined, recognizing sensitivity to this study's sample size and correlations between risk behaviors may lead to significant values. The Bayesian information criterion (BIC) was evaluated to determine relative model fit across models. A low BIC value indicates a well-fitting model. In addition, classification quality or entropy was examined by reviewing posterior probabilities of class membership. Estimates reflect the average likelihood of membership in the determined latent class. Finally, usefulness and interpretability of the latent classes were considered.

The second step—unconditional latent *transition* analyses—estimated models with two to five latent statuses without including covariates. Parameters were restricted to make measurement of latent status equivalent across measurement occasions. Fitting models without covariates facilitated interpretation of latent status and assisted in model identification (Collins & Lanza, 2010). The same fit indices were used to determine the number of latent statuses that provided the best fit to the data.

The third step—conditional latent transition analyses—incorporated covariates to test the effects of adolescent maltreatment and out-of-home placement on sexual risk patterns over

time, accounting for other important risks of unsafe sexual practices. Figure 1 presents a visual description of the final model. Latent variables specified the optimal number of statuses determined from unconditional models. Membership statuses at both time points were regressed on all covariates; this appropriately accounted for relationships between variables and avoided model misspecification from excluding any paths (Collins & Lanza, 2010). Simultaneously, regressions also tested interactions between covariates and baseline latent membership on the probability of transitioning statuses over time (Muthen & Asparauhov, 2011). This provided a formal test of whether covariates predicted transitions in sexual risk behavior.

Given the complexity of these analyses and incomplete models of sexual risk factors for adolescents in contact with the child welfare system, analyses empirically identified important covariates to be included in final latent transition models. In particular, variables that significantly improved model fit were retained compared to unconditional latent transition models (i.e., LTA without covariates). Potential covariates were identified based on theory and prior research, which included youth age, gender, race and ethnicity, out-of-home placement at baseline or follow-up, primary reasons for initial child welfare investigation in adolescence (sexual abuse, physical abuse, emotional abuse, and neglect), substance abuse symptoms at baseline, number of delinquent acts at baseline, and deviant peer association at baseline. Latent transition models included each potential covariate separately; Satorra-Bentler scaled χ^2 difference tests identified variables that improved model fit (Satorra, 2000). Analyses helped find a signal in noise introduced by the inclusion of correlated covariates.

Analyses were conducted using MPLUS Version 5.1 (Muthen & Muthen, 2007). Missing outcomes were handled through maximum likelihood estimation with robust standard errors. In addition, all analyses were weighted to address sampling characteristics, as well as missingness at the 18-month follow-up (Dowd et al., 2004). Sample sizes used for this study met guidelines for latent variable analyses (Collins & Lanza, 2010; Tanaka, 1987). Although limited theoretical base prohibited a priori assumptions, power would be most limited to detect small covariate effects on group membership or transition probabilities to relatively small subgroups. For this reason, cautious interpretations were made for covariate effects on transition probabilities at $p < .10$; other analyses set significance at $p < .05$.

Results

Latent Class Analyses

Table 1 presents weighted percentages of sexual risk behaviors at baseline and 18-month follow-up interviews. Separate latent class models were fit at each time point as a preliminary step to model latent statuses. Models fit 1, 2, 3, 4, and 5 latent classes. For Wave 1, a two-class model provided the highest BIC (1,825.58) and entropy (1.00) compared to solutions derived for 1 class (BIC = 2924.42), 3 classes (BIC = 1849.03 and entropy = .88), and 4 classes (BIC = 1877.74 and entropy = .91). Wave 2 also provided greatest support for a two-class solution (BIC = 2179.13 and entropy = 1.00) compared to 1 class (BIC = 3425.37), 3 class (BIC = 2193.29 and entropy = 1.00), and 4 class (BIC = 2232.01 and entropy = .69) models. Two-class represented low- and high-risk groups on sexual risk

behaviors. Results indicated meaningful subgroups existed within the population of child welfare-involved adolescents in terms of sexual behaviors. Differences in probabilities of class membership at each wave also suggested more than two latent statuses may emerge. Evidence supported modeling latent transitions across time.

Unconditional Latent Transition Analyses

Unconditional latent transition models were fit for 2, 3, 4, and 5 statuses. Models included both time points together without incorporating covariates to identify the solution that provided the best fit to the data. A three latent transition unconditional model provided best fit as demonstrated in Table 2. The three status model exhibited the lowest BIC while producing clear classifications with entropy above 90%. Although the four-status model produced a smaller AIC, the BIC was larger than the three class model and one of the statuses included a very small number of youth.

Conditional Latent Transition Analyses

The conditional model incorporated covariates as predictors of latent status membership and probability of transition over time. Iterative analyses identified variables that improved model fit to the data. A number of covariates did not significantly contribute to the unconditional model, including youth age, gender, race/ethnicity, primary reasons for child welfare investigation of physical abuse, neglect and emotional abuse, substance abuse, delinquency, and deviant peer affiliation. Results suggested sexual abuse as the primary reason for initial child welfare investigation, $\chi^2(2) = 25.43, p < .01$, and continued adolescent maltreatment, $\chi^2(2) = 15.05, p < .01$, produced significant reductions compared to the unconditional model. Out-of-home placement did not worsen model fit, $TRd(2) = 1.84$, and therefore was also included in the final model displayed in Figure 1.

Latent status membership probabilities indicated that the majority of youths abstained from sex in the past 12 months and other risky behaviors as indicated by item response probabilities displayed in Table 3. The group labeled “Abstainers” included 409 (71.4%) youth who reported not having vaginal intercourse in the 12 months prior to interviews and 340 (59.4%) at follow-up. The second largest group included youth who were sexually active in the past 12 months with multiple partners who used condoms during last intercourse labeled “multipartner—safe” in accordance with Lanza and Collins (2008). This subgroup comprised 101 (17.8%) youth at baseline that increased to 211 (37.0%) over the 18-month period. The majority of these youth reported having more than one sexual partner in the past 12 months and all used condoms during the last intercourse. A small minority of these youth experienced pregnancy. The third status represented a small subset of youth engaged in multiple high-risk sexual behaviors. At baseline, this included 61 youth (11.0%) and decreased to 20 youth (3.60%) over time. All of these youth were sexually active in the past 12 months at baseline with a 50% likelihood to report two or more sexual partners in the past 12 months. These youth were unlikely to use condoms during last intercourse and exhibited significant risk to have been pregnant or impregnated someone. These youth were called “multipartner—exposed” as described in Lanza and Collins (2008).

Latent transition probabilities also displayed in Table 3 indicated substantial variability in patterns of risky behaviors over time. Most abstainers ($n = 299$) continued to avoid sexual risk behaviors with a 60% chance of remaining in the abstinent status (low likelihood across risk behaviors at follow-up), and those who changed statuses were 7 times more likely to move toward multipartner—safe sexual activity ($n = 97$) than to multipartner—exposed high-risk sexual behaviors ($n = 14$). Multipartner—safe sexually active youth were much less likely to remain within this classification over time ($n = 70$), and youth had much greater probability to move toward abstinence in the 12 months prior to follow-up interviews ($n = 28$) than multipartner—exposed high-risk sexual behaviors ($n = 4$). Nearly all youth engaging in multipartner—exposed high-risk sexually active behaviors at baseline changed statuses by the 18-month follow-up with only a 3% chance of engaging in risky behaviors at both time points. These youth were more likely to engage in moderate risk multipartner—safe sexual activity ($n = 45$) than abstinence ($n = 15$). Overall, a migration existed over time toward sexual activity but away from high-risk behaviors.

Table 4 presents results from multinomial regressions that tested covariate influences on membership in the three latent statuses over time. Abstainers represented the reference group for these analyses. Effects emerged on prediction of baseline latent status. Maltreatment at baseline only increased the likelihood of falling in the moderate risk multipartner—safe sexually active group compared to abstainers ($b = 1.02$; $SE = .47$; 95% $CI = [.11, 1.94]$; $p = .03$). None of the moderate risk multipartner—safe sexually active youth at baseline experienced subsequent maltreatment; thus, comparisons between abstainers were not estimated. Likewise, all youth in the high-risk multipartner—exposed sexually active group experienced subsequent maltreatment. Maltreatment at follow-up and at both time points provided near perfect prediction of membership into high-risk status compared to abstainers. Out-of-home placement significantly reduced the probability of belonging to the high-risk status at baseline ($b = -2.74$; $SE = .60$; 95% $CI = [-3.92, -1.56]$; $p < .01$). Maltreatment at both time points was significant at $p < .10$, such that exposure increased the probability of transitioning to high-risk multipartner—exposed sexually active ($b = 1.44$; $SE = .83$; 90% $CI = [.07, 2.82]$; $p = .08$).

Discussion

In this study, we examined the relationships between adolescent maltreatment, out-of-home placement as a response to maltreatment, and the development of sexual risk behaviors among vulnerable youth transitioning to adulthood. As hypothesized, variation exists in patterns of sexual risk behaviors over time among child welfare-involved youth. Contrary to prior research that examines overall levels of risk behavior (Ahrens et al., 2010; Courtney et al., 2007), most youth migrate toward relatively safer sexual practices. Results also suggest a complicated relationship between early sexual risk and maltreatment over time. This study represents one of few explicit investigations of developmental processes involved in sexual behaviors among at-risk adolescence and findings inform both service provision and developmental theory.

Changes in Sexual Risk Among Child Welfare–Involved Adolescents

Results from this study inform developmental understanding of risky sexual behaviors in adolescence and the transition to adulthood. Prior longitudinal research conducted with national probability samples of adolescents suggests more variation in developmental transitions than observed in this study. Among adolescents at risk of exposure to abuse and neglect, three meaningful subgroups emerge compared to four and five classes found in studies of nationally representative samples of lower risk youth (Huang, Murphy, & Hser, 2012; Lanza & Collins, 2008; Moilanen, Crockett, Raffaelli, & Jones, 2010). A number of methodological considerations may explain this phenomenon, including different measurement and indicators of sexual risk, various birth and age cohorts examined, varying lengths of follow-up periods, and statistical power. In addition, this study had the smallest number of measurement occasions (i.e., two time points), which compromises ability to detect nonlinear changes in risk behaviors over time. However, cautious comparisons between studies suggest the potential of an alternative explanation—environmental adversity experienced by child welfare–involved adolescents may constrain developmental opportunities.

A close inspection of the study that shares the most similar methodology (Lanza & Collins, 2008) conducted with a normative sample of adolescents finds a number of meaningful parallels and divergences with the present study. Both studies show a substantial proportion of youth abstain from sex with variation around whether abstinence occurs within dating behaviors. This group becomes smaller over time, likely reflecting the increasing propensity to be sexually active with age. The proportional size of this group is larger in the current study, probably due to the younger average age of youth ($M = 15$ years at baseline vs. $M = 18$). In both studies, we also see similarly sized subgroups of youth at baseline who engage in sex with multiple partners—either practicing safer sex or not. An interesting contrast between studies shows differences in the pattern of changes in membership in these classes over time. Among at-risk adolescents, the number of youth having unsafe sex with multiple partners decreases over time, with most of these youth transitioning to practicing safer sex with multiple partners 18 months later. In comparison, Lanza and Collins (2008) report increases in the number of youth practicing unsafe sex with multiple partners and decreases in multipartner safe sex (Lanza & Collins, 2008). This corresponds with the other national studies of adolescents that found sizable subgroups of teens engaging in increasing levels of sexual risk that vary in the timing of when these increases occur (Huang et al., 2012; Moilanen et al., 2010).

Comparisons suggest a different function of developmental risk across time associated with environmental conditions. Vulnerable teens exposed to abusive environments downregulate sexual risk across adolescence, whereas youth in normative samples upregulate sexual risk behaviors into emerging adulthood (Duncan, Strycker, & Duncan, 1999; Huang et al., 2012; Moilanen et al., 2010). This may reflect regression to the mean among at-risk youth; however, similar developmental subgroups emerge in at-risk and normative samples. The differences in behavior seen in this study suggest a potential adaptation of behavior based on prior experiences. Family environments characterized by disruption and violence may

contribute to greater management of behavior over time. Simultaneously, chaotic family life may require youth to disengage from other peers, which lowers risk for sexual activity.

Another key difference between the present study and Lanza and Collins (2008) reflects the presence of a class of youth in normative samples who engage in monogamous relationships that increases in group size over time (Lanza & Collins, 2008). This subgroup does not emerge across time among adolescents exposed to risk for abuse. Instead, developmental course moves youth toward either abstinence or safe sex with multiple partners. Specifically, youth who abstained from sex at baseline most likely transition to safer sex with multiple partners, and Multipartner—Exposed youth are more likely to continue having sex with multiple partners but using a condom. This represents a qualitative difference with normative samples of youth with missing opportunities to practice exclusive dating relationships. The absence of this subgroup may represent constrained developmental opportunities associated with environmental risk. Youth respond to exposure to abuse and its associated environmental risks earlier in adolescence by regulating behavior in ways that differ from less vulnerable contexts in which other teens grow up. Alternatively, child welfare-involved youth may experience disturbances in attachment representations with caregivers that distort intimate partner relationships in ways that make moving toward stable, monogamous sexual partnerships more difficult.

The absence of this class may, again, be explained by the younger age of at-risk youth; teens transitioning to adulthood may be more inclined to settle into stable relationships. However, evidence from this study suggests older at-risk youth exhibit the same subgroups of sexual risk behaviors as other youth in the sample, which counters the alternative explanation of age. Likewise, the pattern functioned similarly across youth gender, racial and ethnic group, as well as other behavioral problems, and thus cannot be explained by common individual sources of developmental variation in sexual risk.

An important unexamined factor is socioeconomic status, which this study cannot adequately examine, given the design—youth remaining with caregivers and placed into out-of-home situations disproportionately experience poverty. Low-income living conditions associated with risk of abuse and neglect may explain these effects. It could be poverty constrains development, and not specifically abuse and neglect. Future research using normative samples that examines developmental variation in sexual risk in the context of multiple environmental risks offers an opportunity to better understand the mechanisms involved.

Role of Repeated Abuse and Out-of-Home Placement

Contrary to study hypotheses, recent and repeated abuse fails to increase risk for enduring patterns of risky sexual behavior. Instead, youth reporting repeated or later experiences of abuse in adolescence demonstrate riskier sexual behaviors at baseline immediately following child protective services investigation. The same pattern exists across youth age, gender, ethnicity, behavior problems, and child welfare involvement in this population. None of the theorized environmental factors predict changes in developmental statuses over time. Although articulating the mechanisms underlying this process remains out of the purview of this study, it may be theorized that adolescent sexual behaviors evoke negative reactions

from caregivers prior to investigation by child protective services; for instance, youth struggling with the challenges of transitioning to sexual activity may interface with caregivers who respond harshly to this emotionally charged context. It could also be that youth engage in riskier behaviors because of deteriorated parental monitoring and emotional support from parents, and this threatens subsequent vulnerability for maltreatment. Caution must be applied in interpretation, given that temporal precedence cannot be determined given all youth were subjects of child welfare investigation. Future research into these mechanisms will greatly inform potential interventions.

Another major finding from this study shows youth demonstrating the riskiest sexual practices at the time of child welfare involvement are much less likely to be placed into out-of-home care. Given these youth are also more likely to experience subsequent maltreatment, the most vulnerable youth may remain unidentified by child welfare. While it is unclear if the circumstances in the home environment were more dangerous for the youth than the investigators were able to assess at first report of maltreatment, this finding reflects increased vulnerability in these youth that warrants attention and intervention.

Limitations

A number of limitations must be considered in interpreting findings from this study. A major limitation of this study is the indicators of sexual risk behaviors available for analyses. This study focused on vaginal intercourse, and therefore excludes very important sexual practices among the same-sex partners. Likewise, sexual risk indicators available in this study fail to capture the full spectrum of sexual risk behaviors and associated severity of risk. For instance, condom use only assessed last sexual intercourse, while sexual activity within romantic relationships was not measured at all. The constrained assessment of sexual risk limits generalizability of findings to most directly predict risk for STIs among heterosexual encounters. Another limitation concerns sample size and statistical power to test environmental effects. The NSCAW study represents the largest and only nationally representative survey of youth involved in the child welfare system with stronger measurement of abuse conditions than available in other national studies of adolescents; however, cell sizes were small when considering developmental heterogeneity and exposure to low prevalence environmental risks. Likewise, the study design that incorporated national probability sampling may conceal important local social dynamics that contribute to sexual risk. Future research that examines developmental heterogeneity in relation to social networks offers a unique opportunity to understand the complexity involved in identifying and intervening on sexual risk.

Another limitation refers to the follow-up period. At the time of analyses, only two waves of data collected 18 months apart were available. This limits understanding of processes involved in the transition to adulthood. Additional data points allow more extensive examination of diversity in sexual risk patterns over time, as well as inform understanding of consistency of behaviors. Ongoing data collection will allow future research to investigate patterns across a third wave of data at 36 months postchild welfare investigation. Such analyses will greatly inform service provision targeting at-risk adolescents in contact with child protective services. Furthermore, a more thorough assessment of the type and timing of

services received through the child welfare and other youth-serving systems may better inform intervention points. For instance, receipt of certain evidence-based mental health interventions that remained unmeasured in these analyses may facilitate positive youth development and guide program development.

Conclusions

Adolescents involved in the child welfare system represent a vulnerable population for whom appropriate and effective services are needed to promote healthy transitions to adulthood. Findings from this study indicate a positive developmental trend toward healthier sexual practices over time among a nationally representative sample of youth in contact with child welfare. Many adolescents continue to practice abstinence after initial child protective services investigation, and those exhibiting risky sexual behaviors most likely move toward safer sexual behavior. The study provides important information for prevention programming implemented within the child welfare system.

Acknowledgments

Funding

The project described was supported by Award Number R03HD066066 from the Eunice Kennedy Shriver National Institute Of Child Health & Human Development. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute Of Child Health & Human Development or the National Institutes of Health.

References

- Ahrens KR, Richardson LP, Courtney ME, McCarty C, Simoni J, Katon W. Laboratory-diagnosed sexually transmitted infections in former foster youth compared with peers. *Pediatrics*. 2010; 126:e97–e103. [PubMed: 20547646]
- Black MM, Oberlander SE, Lewis T, Knight ED, Zolotor MD, Litrownik AJ, English DE. Sexual intercourse among adolescents maltreated prior to age 12: A prospective investigation. *Pediatrics*. 2009; 124:941–949. [PubMed: 19706574]
- Capaldi, D., Patterson, GR. Psychometric properties of fourteen latent constructs from the Oregon Youth Study. New York, NY: Springer-Verlag; 1989.
- Carpenter SC, Clyman RB, Davidson AL, Steiner JF. The association of foster care or kinship care with adolescent sexual behavior and first pregnancy. *Pediatrics*. 2001; 108:E46. [PubMed: 11533364]
- Collins, LM., Lanza, ST. Latent class and latent transition analysis for the social, behavioral, and health sciences. New York, NY: John Wiley; 2010.
- Connell CM, Gilreath TD, Hansen NB. A multiprocess latent class analysis of the co-occurrence of substance use and sexual risk behavior among adolescents. *Journal of Studies on Alcohol and Drugs*. 2009; 70:943–951. [PubMed: 19895772]
- Courtney, ME., Dworsky, A., Brown, A., Cary, C., Love, K., Vorhies, V. Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 26. 2011. Retrieved August 27, 2012, from <http://www.chapinhall.org/research/report/midwest-evaluation-adult-functioning-former-foster-youth>
- Courtney, ME., Dworsky, A., Cusick, GR., Havlicek, J., Perez, A., Keller, T. Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 21. 2007. Retrieved January 17, 2013, from <http://www.chapinhall.org/research/report/midwest-evaluation-adult-functioning-former-foster-youth>

- Courtney, ME., Dworsky, A., Less, JS., Raap, M. Midwest evaluation of the adult functioning of former foster youth: Outcomes at ages 23 and 24. 2010. Retrieved January 1, 2011, from <http://www.chapinhall.org/research/report/midwest-evaluation-adult-functioning-former-foster-youth>
- Courtney, ME., Terao, S., Bost, N. Midwest evaluation of the adult functioning of former foster youth: Conditions of youth preparing to leave state care. 2004. Retrieved January 17, 2013, from <http://www.chapinhall.org/research/report/midwest-evaluation-adult-functioning-former-foster-youth>
- Dowd, K., Kinsey, S., Wheelless, S., Thissen, RR., Richardson, J., Mierzwa, F., Biemer, P. National survey of child and adolescent well-being (NSCAW): Combined waves 1-4 data file user's manual. Durham, NC: Research Triangle Institute; 2004.
- Duncan SC, Strycker LA, Duncan TE. Exploring associations in developmental trends of adolescent substance use and risky sexual behavior in a high-risk population. *Journal of Behavioral Medicine*. 1999; 22:21–34. [PubMed: 10196727]
- Dworsky A, Courtney ME. The risk of teenage pregnancy among transitioning foster youth: Implications for extending state care beyond age 18. *Children and Youth Services Review*. 2010; 32:1351–1356.
- Elliott DS, Ageton SS. Reconciling race and class differences in self-reported and official estimates of delinquency. *American Sociological Review*. 1980; 45:95–110.
- Haydon AA, Hussey JM, Halpern CT. Childhood abuse and neglect and the risk of STDs in early adulthood. *Perspectives on Sexual and Reproductive Health*. 2011; 43:16–22. [PubMed: 21388501]
- Huang DY, Murphy DA, Hser YI. Developmental trajectory of sexual risk behaviors from adolescence to young adulthood. *Youth & Society*. 2012; 44:479–499. [PubMed: 23710100]
- Hussey JM, Marshall JM, English DJ, Knight ED, Lau AS, Dubowitz H, Kotch JB. Defining maltreatment according to substantiation: Distinction without a difference? *Child Abuse and Neglect*. 2005; 29:479–492. [PubMed: 15970321]
- James S, Montgomery SB, Leslie LK, Zhang J. Sexual risk behaviors among youth in the child welfare system. *Children and Youth Services Review*. 2009; 31:990–1000. [PubMed: 23606780]
- Jones DJ, Runyan DK, Lewis T, Litrownik AJ, Black MM, Wiley T, Nagin DS. Trajectories of childhood sexual abuse and early adolescent HIV/AIDS risk behaviors: The role of other maltreatment, witnessed violence, and child gender. *Journal of Clinical Child and Adolescent Psychology*. 2010; 39:667–680. [PubMed: 20706919]
- Kaestle CE. Selling and buying sex: A longitudinal study of risk and protective factors in adolescence. *Prevention Science*. 2012; 13:314–322. [PubMed: 22350114]
- Kohl PL, Jonson-Reid M, Drake B. Time to leave substantiation behind: Findings from a national probability sample. *Child Maltreatment*. 2009; 14:17–26. [PubMed: 18971346]
- Knight JR, Sherritt L, Gates E, Harris SK. Should the CRAFFT substance abuse screening test be shortened? *Journal of Clinical Outcomes Management*. 2004; 11:19–25.
- Knight JR, Sherritt L, Harris SK, Gates E, Chang G. Validity of brief alcohol screening tests among adolescents: A comparison of the AUDIT, POSIT, CAGE, and CRAFFT. *Alcohol Clinical and Experimental Research*. 2003; 27:67–73.
- Knight JR, Sherritt L, Shrier LA, Harris SK, Chang G. Validity of the CRAFFT substance abuse screening test among adolescent clinic patients. *Archives of Pediatrics & Adolescent Medicine*. 2002; 156:607–614. [PubMed: 12038895]
- Knight JR, Shrier LA, Bravender TD, Farrell M, Vander Bilt J, Shaffer HJ. A new brief screen for adolescent substance abuse. *Archives of Pediatrics & Adolescent Medicine*. 1999; 153:591–596. [PubMed: 10357299]
- Lanza ST, Collins LM. A new SAS procedure for latent transition analysis: transitions in dating and sexual risk behavior. *Developmental Psychology*. 2008; 44:446–456. [PubMed: 18331135]
- Leslie LK, James S, Monn A, Kauten MC, Zhang J, Aarons G. Health-risk behaviors in young adolescents in the child welfare system. *Journal of Adolescent Health*. 2010; 47:26–34. [PubMed: 20547289]
- Moilanen KL, Crockett LJ, Raffaelli M, Jones BL. Trajectories of sexual risk from middle adolescence to early adulthood. *Journal of Research on Adolescence*. 2010; 20:114–139.

- Muthen, B. Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data. In: Kaplan, D., editor. Handbook of quantitative methodology for the social sciences. Newbury Park, CA: Sage; 2004. p. 345-368.
- Muthen B, Asparauhov T. LTA in Mplus: Transition probabilities influenced by covariates. 2011; (13) Mplus Web Notes.
- Muthén, LK., Muthén, BO. MPlus user's guide. 4th. Los Angeles, CA: Muthén & Muthén; 2007.
- Noll JG, Trickett PK, Putnam FW. A prospective investigation of the impact of childhood sexual abuse on the development of sexuality. Journal of Consulting & Clinical Psychology. 2003; 71:575–586. [PubMed: 12795580]
- Polit DF, White CM, Morton TD. Child sexual abuse and premarital intercourse among high-risk adolescents. Journal of Adolescent Health Care. 1990; 11:231–234. [PubMed: 2358392]
- Risley-Curtiss C. Sexual activity and contraceptive use among children entering out-of-home care. Child Welfare. 1997; 76:475–499. [PubMed: 9218339]
- Satorra, A. Scaled and adjusted restricted tests in multi-sample analysis of moment structures. In: Heijmans, RDH, Pollock, DSG., Satorra, A., editors. Innovations in multivariate statistical analysis A Festschrift for Heinz Neudecker. London, England: Kluwer Academic Publishers; 2000. p. 233-247.
- Senn TE, Carey MP, Venable PA. Childhood and adolescent sexual abuse and subsequent risk behavior: Evidence from controlled studies, methodological critique, and suggestions for research. Clinical Psychology Review. 2008; 28:711–735. [PubMed: 18045760]
- Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with Parent–Child Conflict Tactics Scale. Development and psychometric data for a national sample of American parents. Child Abuse & Neglect. 1998; 22:249–270. [PubMed: 9589178]
- Tanaka JS. “How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. Child Development. 1987; 58:134–146.

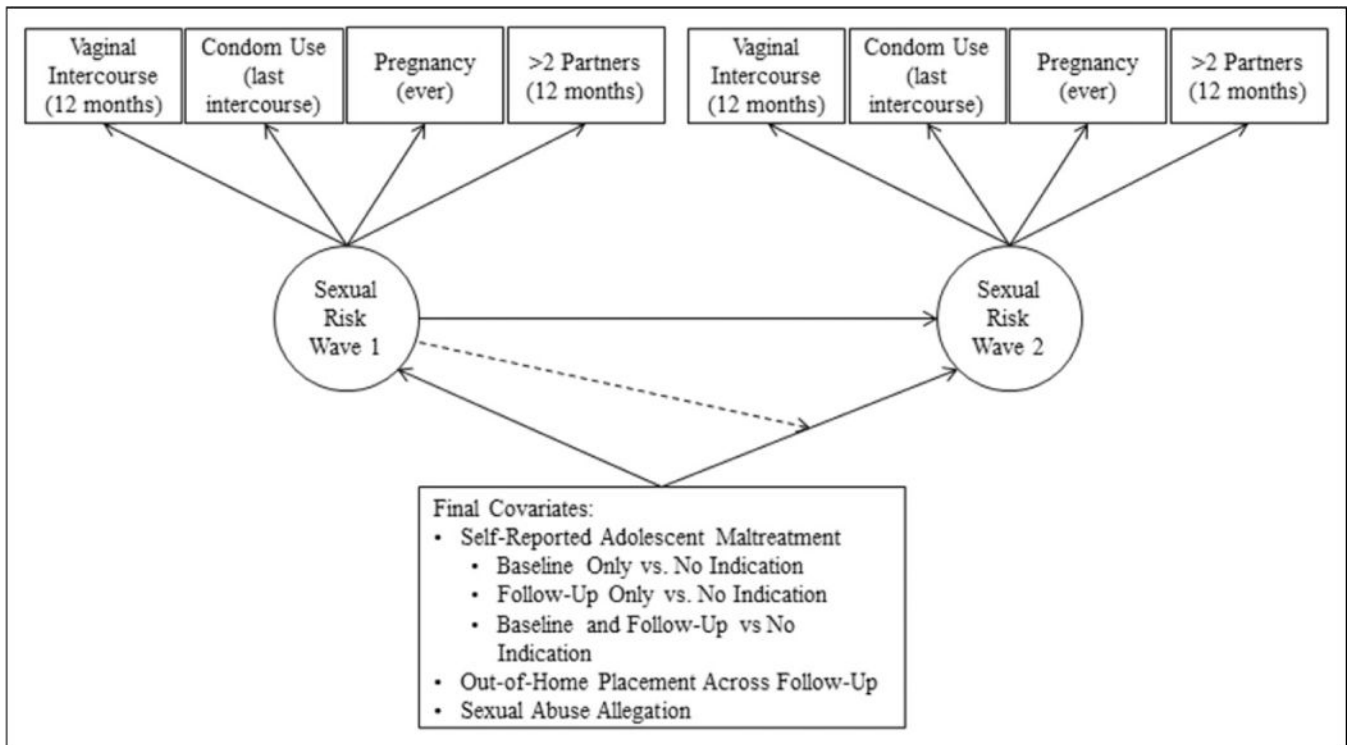


Figure 1. Latent transition analysis final model. Dichotomous sexual risk behaviors (yes/no) measured at baseline (wave 1) and 18 months later (wave 2) informed three latent indicators of sexual risk at each time point. Measurement invariance was assumed across time and classes. Empirically identified covariates predicted latent status membership, as well as change in status (dashed line) between time points using multinomial regression. Multilevel analyses incorporated sampling weights to account for study characteristics.

Table 1

Percentages of Adolescents Engaging in Risky Sexual Behaviors at Baseline and 18-Month Follow-Up Weighted for Sampling Characteristics.

Sexual risk behavior	Baseline, %	Follow-up, %
Had sex anytime in the past 12 months	68.3	56.4
Ever been/ever gotten someone pregnant	5.5	10.9
Two or more sexual partners in past 12 months	17.4	24.0
Used condom in last sexual intercourse	10.0	17.9

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Summary of Fit Criteria Used to Select Number of Latent Statuses of Adolescent Risky Sexual Behavior at Baseline and 18-Months Later.

Table 2

Latent status	df	Pearson χ^2	AIC	BIC	Entropy
2	241	392.126	3,557.203	3607.483	.941
3	232	190.237	3,470.882	3562.300	.922
4	221	116.218	3,444.909	3586.606	.970
5	208	62.809	3,440.336	3641.454	.922

Note. $n = 714$; $df =$ degrees of freedom; AIC = Akaike information criteria; BIC = Bayesian information criteria. Bold values indicates the best fitting model across indices.

Table 3

Item Response Probabilities Constrained Equal Across Time and Latent Transition Probabilities Conditioned on Baseline Latent Status for Three-Class Latent Status Conditional Model.

Sexual risk item	Response probabilities by latent status at baseline		
	Abstainers	Multipartner—Safe	Multipartner—Exposed
Vaginal sex in past 12 months	0.0	1.00	1.00
Sex without condom in past 12 months	0.0	0.0	.65
Number of sexual partners in past 12 months	0.0	.58	.50
Pregnant/impregnated	0.0	0.05	.36

Transition probabilities			
Follow-up membership			
Baseline membership	Abstainers	Multipartner—Safe	Multipartner—Exposed
Abstainers	0.601	0.359	0.041
Multipartner—Safe	0.618	0.343	0.039
Multipartner—Exposed	0.516	0.459	0.025

Note. $n = 573$; Response probabilities represent the likelihood status members endorsed each sexual risk at baseline, while transition probabilities reflect the chance of follow-up status membership given baseline status. The main diagonal signifies stability over time, while off-diagonals denote transition in statuses.

Table 4

Odds Ratios and 90% Confidence Intervals of Predictors on Latent Status Membership at Baseline and Follow-Up Weighted for Sampling Characteristics at Follow-Up.

	Baseline		18-month follow-up	
	Multipartner—Safe (<i>n</i> = 101, 18%)	Multipartner—Exposed (<i>n</i> = 61, 11%)	Multipartner—Safe (<i>n</i> = 211, 37%)	Multipartner—Exposed (<i>n</i> = 20, 4%)
Maltreatment at baseline only	2.78* (1.28, 6.02)	—	2.97 (.75, 11.72)	.02 (0.0, 0.0)
Maltreatment at follow-up only	—	11.15 [†] (1.29, 96.72)	3.42 (.78, 14.89)	.00 (0.0, 0.0)
Maltreatment at both baseline and follow-up	—	35.48** (3.81, 329.69)	4.23 (1.07, 16.71)	.00 (0.0, 2.80)
Sexual abuse	2.37 (.98, 5.71)	1.74 (.98, 5.71)	1.41 (.57, 3.52)	.39 (.02, 8.00)
Out-of-home placement	.99 (.42, 2.33)	.06** (.02, .17)	1.05 (.40, 2.75)	.03 (0, 167.13)

Note. *n* = 573; abstainers represent reference class (*n* = 409 at baseline, *n* = 340 at follow-up); — indicates fixed parameters because of empty cells in the contingency table; follow-up estimates represent the interaction between covariates and baseline sexual risk latent status.

[†]*p* < .10,

* *p* .05,

** *p* .01.