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Family formation: A positive outcome for vulnerable young women?

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Abstract

While marriage and childbirth are generally considered positive adult outcomes, it is not clear that this holds true among low income young women. Beyond adolescent parenting, little empirical data exists on various types of family formation in this population. The aims of this study were twofold: (1) to understand predictors of type of family formation (e.g., none, childrearing, marriage, or both) among 4,385 young women with childhood histories of poverty and/or maltreatment; and (2) to explore whether family formation patterns were associated with negative adult behavioral and health outcomes. Results of the AIM 1 multinomial regression analysis of family formation indicated that the likelihood of childrearing with or without marriage increased with an increase in the number of adolescent risk behaviors after controlling for the maltreatment and/or poverty histories. Among women with maltreatment histories, early onset maltreatment was associated with childrearing or marriage compared to no family. Among previously maltreated women, predictors of family formation varied according to prior poverty history. AIM 2 Cox regression results indicated that having children with or without marriage was associated with a higher risk of negative outcomes after controlling for maltreatment and adolescent risk factors. Bivariate analyses suggested that most of the increased risk was associated with having at least two children. Findings underscore the importance of preventing adolescent risk behaviors among

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low income and maltreated girls as well as early and unplanned births among vulnerable young adult women.

Keywords

family formation; childhood maltreatment; poverty; parenting; longitudinal study

1. Introduction

The transitional period between late adolescence through the late 20's has been identified as a unique developmental stage in which particular milestones such as forming intimate partnerships are expected (Arnett, 2006). In the US, family formation, commonly defined as marriage or becoming a parent, typically occurs during this period. As of 2014, the median age at first marriage for women is 27 and men is 29 years (U.S. Census Bureau, 2014) and average age of becoming a first-time mother is 26 years (Bichell, 2016). Marriage is generally associated with a range of positive outcomes for adults and children, including better emotional and physical health (Liu, Elliott, & Umberson, 2010; Musick, & Bumpass, 2012). It is hypothesized that such benefits might be stronger for women because of being both more sensitive to and more emotionally and physically affected by the quality of marriage (Kiecolt-Glaser, & Newton, 2001). It is not clear, however, if this generally positive association holds for vulnerable sub-groups of young adults with prior histories of trauma or poverty. While childbirth in adulthood is rarely considered a negative outcome, this may vary by context. Childrearing both in and out of marriage may be associated with poorer outcomes in young adults if there is significant impact on socioeconomic status, constraints on sleep and exercise, partner stress, and/or challenges associated with readiness and planning (Broussard, Joseph, & Thompson, 2012; Burgard, & Ailshire, 2013; Herd, Higgins, Sicinski, & Merkuieva, 2016).

Of course outcomes associated with family formation may be impacted by factors associated with marriage and childrearing. Both poverty and trauma history may affect family formation in multiple ways. Childhood victimization and trauma can impinge on the individual's capacity to form stable positive relationships (Whisman, 2006). Socioeconomic disadvantage is associated with early parenting and early marriage (Coyne, & D'Onofrio, 2012; Meade, Kershaw, & Ickovics, 2008; Whitehead, 2009). Such early family formation has been linked to negative outcomes in later adulthood, especially for already at-risk young adults (Wickrama, Conger, Wallace, & Elder, 2003). Childhood poverty and experiences of maltreatment are strongly associated with one another (Drake, Lee, & Jonson-Reid, 2009; Pelton, 2015). Despite this, little work (e.g., Allwood, & Widom, 2013; Colman, & Widom, 2004; Thornberry, Krohn, Augustyn, Buchanan, & Greenman, 2015) has been done on family formation for adults with histories of abuse or neglect and poverty. Prior studies have focused mainly on teen parenting or relationship quality among sexual abuse survivors. While both men and women may be impacted by such factors, the increased likelihood of women being sole caregivers of children, make the study of the range of family formation types particularly key to understanding this population.

The current study helps fill this gap in knowledge by exploring how childhood poverty and maltreatment histories are related to subsequent family formation among young adult women and then exploring how family formation patterns are associated with other adult behavioral and health outcomes. Because of the focus on young women in this study, the background literature is also similarly targeted.

1.1. Background

1.1.1 Economic disadvantage and family formation—Several studies have found that marriage is associated with positive outcomes for adults and children (Liu et al., 2010; Musick, & Bumpass, 2012). There are, however, a host of caveats. Some research indicates distressed marriages may be particularly harmful to the mental and physical health of women (Gibson-Davis, Edin, & McLanahan, 2005). Another concern is that marriage and early motherhood may not operate in the same way for very low income and otherwise vulnerable populations. Socioeconomic disadvantage has been associated with early parenting and early marriage (Coyne, & D’Onofrio, 2012; Meade et al., 2008; Whitehead, 2009). Very early family formation has been linked to negative outcomes in later adulthood, especially for already at-risk young adults (Wickrama et al., 2003), but this association is complex. Research indicates that poor women are less likely to be married and more likely to have children outside of marriage than non-poor women (Edin, & Reed, 2005). Lichter, Graefe and Brown (2003) found that women from disadvantaged family backgrounds (including poverty and single-parent families) had more children outside marriage, were more likely to live in poverty, and had substantially lower rates of subsequent marriage after childrearing than other women. That same study found that, among those lower income women who did marry and stayed married, their long term economic status was better than never married or divorced women. Thus, poverty may impact early family formation and type of family formation which, in turn, impact longer term socioeconomic status (Thornberry et al., 2015). Poverty is associated with a host of negative outcomes across behavioral and health domains.

1.1.2 Child maltreatment and family formation—A history of child maltreatment has also been associated with early family formation. The Relational Model of Women’s Psychological Development suggests that healthy connections with others are fundamental to women’s psychological wellbeing (Belenky, Clinchy, Goldberger, & Tarule, 1986; Gilligan, 1982; Jordan, Kaplan, Miller, Stiver, & Surrey, 1991). Disconnections or violations within relationships (such as maltreatment), arising at personal or familial levels, disrupt women’s psychological development (Covington, & Surrey, 2000). Hypothetically, the increased prevalence of mental health and behavioral problems among survivors of maltreatment may then complicate their ability to form adult relationships (Jonson-Reid, Drake, & Kohl, 2009; Nikulina, Widom, & Czaja, 2011; Reyome, 2010). Findings regarding the association between maltreatment and an increased or decreased likelihood of later marriage, however, have been mixed (Cherlin, Burton, Hurt, & Purvin, 2004; Colman, & Widom, 2004; Southerland, Casanueva, & Ringeisen, 2009).

With two exceptions, research on childrearing and maltreatment has focused on adolescent parenting. Southerland and colleagues (2009) found that transition age youth (age 18–21

years) who were involved in child maltreatment investigations as adolescents were more likely to begin parenting early. Another study found that adolescent girls or young women with histories of foster care were at a somewhat greater risk of early child rearing though the magnitude of risk associated with foster care as compared to prior maltreatment *per se* was unclear (King, Putnam-Hornstein, Cederbaum, & Needell, 2014). An investigated report of maltreatment increased the risk of teen pregnancy by about 60% in a study controlling for family and community poverty as well as other youth risk behaviors (Garwood, Gerassi, Jonson-Reid, Plax, & Drake, 2015). Both sexual abuse and neglect in childhood have been linked to early sexual behavior and risk for early parenting (Brown, Cohen, Chen, Smailes, & Johnson, 2004; Davis, & Petretic-Jackson, 2000; Hahm, Lee, Ozonoff, & Van Wert, 2010; Noll, & Shenk, 2013; Thompson, & Neilson, 2014). However, in other studies maltreatment type has not been key to outcomes once recurrent maltreatment was controlled (Jonson-Reid et al., 2012) suggesting cumulative exposure may be more important than type of maltreatment, over time.

1.1.3 Poverty, maltreatment, and adolescent risk indicators—Both poverty and child maltreatment are associated with an increased likelihood of risky behaviors and poor health outcomes throughout childhood and adolescence (Bender, 2010; Bright, Kohl, & Jonson-Reid, 2014; Jonson-Reid, Drake, & Kohl, 2009; Yoshikawa, Aber, & Beardslee, 2012). There are several possible mechanisms that may explain associations between early family formation, trauma and risk and negative adult outcomes. It is possible that the relationship between maltreatment and developmental problems in adolescence may lead to what Liu and colleagues (2010) refer to as a continuity of adaptation into young adulthood that is not impacted by family formation. On the other hand, a small literature suggests that later adult outcomes may be associated with early social risk behaviors leading to early family responsibilities which in turn are associated with poor adult health (Oxford, Gilchrist, Lohr, Gillmore, Morrison, & Spieker, 2005; Wickrama et al., 2003). Another possibility is that there is a direct overwhelming connection between maltreatment and later negative adult outcomes that is stronger than any buffering impact of family formation (Allwood, & Widom, 2013; MacMillan, et al., 2001; Sperry, & Widom, 2013). Negative adult outcomes within a vulnerable population may also reflect the import of cumulative risk rather than paths stemming from individual forms of trauma, early family formation, or other risk indicators (Chartier, Walker, & Naimark, 2010; Edwards, Holden, Felitti, & Anda, 2003). Or the trauma associated with maltreatment and/or intermediary risk factors may result in poor partner selection. At least one study found that a tendency to select antisocial partners may exacerbate the link between child maltreatment and adult criminal behavior among women (Lee, Herrenkohl, Jung, Skinner, & Kilka, 2015).

The present study helps fill some of the remaining gaps in understanding the relationship of poverty and maltreatment to young adult family formation among women and the subsequent association of family formation types with negative behavioral, health, and mental health indicators. Study aims, research questions and hypotheses follow.

Aim 1: To understand the association of maltreatment, poverty and other childhood risk factors to family formation (none, children only, marriage only or both) in young adulthood.

(1.1) Are family formation patterns associated with childhood history of maltreatment alone, poverty alone or a combination among young adult women controlling for other factors? Hypothesis: The association of maltreatment and poverty with rearing children outside marriage suggests a higher rate of non-married childbirth among women with histories of both maltreatment and poverty compared to poverty or maltreatment alone.

(1.2) Are there differences in patterns of family formation among women with a prior maltreatment history by type, onset, and recurrence of maltreatment or placement into foster care? The literature specific to maltreatment characteristics and family formation is not sufficient to suggest hypotheses.

Aim 2: To understand the association of family formation (none, children only, marriage only or both) to negative adult outcomes, controlling for child and adolescent risk factors.

(2.1) Are family formation patterns associated with negative adult outcomes? Hypotheses: Given prior research, there will be an increased risk of negative outcomes for single parents as compared to young women who are married only or married with children.

2. Method

2.1 Sample

The present study focuses on family formation and its effects on young adult women with childhood histories of maltreatment and/or poverty. Data are drawn from a large longitudinal administrative data study (hereafter noted as the ‘parent study’) of maltreated children, low income children reported for maltreatment and a matched comparison of children living in low income families but not reported for maltreatment. At the time of sampling (1993–1994), children were age 11 or younger, and lived in a large Midwestern metropolitan area. Children with first known official child maltreatment reports during 1993 or 1994 were included in the study and placed in “Maltreatment Only” or “Maltreatment and Poverty” groups, based on whether or not their families had received income assistance, then Aid to Families with Dependent Children (AFDC). From the unmatched children who received AFDC, but who did not have a child maltreatment report, a third group was created by randomly selecting matches by age and region. When multiple children under age 11 existed, one child per family was randomly selected for study inclusion. Subjects were followed through 2009. The present sample was limited to the 4385 women who reached adulthood (age 18) at least one year prior to the end of the data collection period. The sample consisted of four groups of participants: (1) the maltreatment-only group ($n = 739$), (2) the poverty-only group ($n = 1235$), (3) the maltreatment and poverty group ($n = 1764$) and (4) the “crossovers” group ($n = 647$) including women who started out in the poverty only or maltreatment only group and then later crossed over with a record in the other data source. After preliminary analyses, groups 3 and 4 were deemed similar enough to combine leaving three groups: (1) the maltreatment-only group ($n = 739$), (2) the poverty-only group ($n = 1235$), (3) the maltreatment and poverty group ($n = 2411$).

2.2 Data

'Parent study' data included tract-level 1990 US census information, statewide birth and death records, statewide child welfare data including maltreatment reports, mental health billing from statewide Department of Mental Health, Medicaid data including health hospitalization and inpatient and outpatient mental health treatment, expanded statewide health coverage (child only), emergency department records, income maintenance (AFDC and later Temporary Aid to Needy Families), special education data, statewide corrections and highway patrol records, civil protection orders, regional juvenile court information, and data from runaway shelters. Caregiver and child demographic information were obtained from birth records, child welfare and income maintenance data.

Codebooks and data entry procedures were collected from each agency and employed along with available literature and discussions with agency representatives to guide cleaning and recoding. Preliminary analyses were shared with each agency to further check on proper understanding of the meaning of variables. Most datasets were linked using a common state level identifier. The remaining data sets were linked using a composite name/birthdate/gender match variable. Resulting matches were checked across data sets over time. Address information from AFDC and child welfare were geocoded using Arcview and assigned census tracts to link to US census information. All identifying information was then removed before creation of the analysis data set. Procedures involving data collection and management were approved by the Human Research Protection Office of XXXX (omitted for blind review) and each agency contributing data.

2.3 Variables

2.3.1 Dependent variables—For the first two research questions, corresponding to aim 1, the dependent variable is family formation defined as a categorical variable with categories marriage without children, marriage with one child, marriage with two or more children, one child without marriage, and two or more children without marriage. For the second aim, the dependent variable is any negative outcome in young adulthood, including one or more of the following: health care records for issues of obesity, diabetes, or a chronic health problem; perpetration of child abuse and/or neglect; adult arrest; emergency room care for domestic violence; or treatment for mental health diagnosis according to ICD-9 codes; and death. The inclusive nature of our "negative outcome" is partly to confer additional statistical power and should not be construed as implying similarities between specific categories listed.

2.3.2—Demographic and family of origin variables included child age, gender and race (recoded as 'White' v 'Non-white' because the demographics of the region at the time – the "Non-White" category is almost exclusively African-American). Family variables included caregiver age, history of foster care as youth and caregiver's high school graduation status. Census tract poverty and education variables were also available.

2.3.3 Maltreatment and family poverty variables—Abuse and neglect reports included type of maltreatment collapsed into physical abuse, sexual abuse, neglect or other

as well as the number of reports over time. Family poverty as indicated by receipt of income maintenance was divided into prior to age 5 only, school-age only, or both.

2.3.4 Emotional and behavioral indicators prior to age 18—These variables included a history of runaway, health care for pregnancy as a teen, specialty mental health or special education for emotional disturbance, delinquency petition, and record of STD treatment prior to age 18. For multivariate analyses a composite variable of the number of indicators of risky behaviors in adolescence was created by summing the scores for each of these dichotomized adolescent behavioral indicators (1/0), resulting in scores that ranged from 0 to 5 (the number of total adolescent risky behavior indicators). For analyses of later adult outcomes, this composite was collapsed into 0 to 4 or more.

2.4 Analyses

All analyses were done in SAS Version 9.4. In addition to bivariate analyses, family formation was analyzed using a multinomial logistic regression model (Allison, 2012) because aim 1 was concerned with the final type of family formation by the end of the study when subjects were age 19–26 years. Bivariate analyses of family formation and later adult outcomes were broken out by numbers of children within single parent or married with children categories, however, cell sizes for assessing multivariate associations with predictors required collapsing the family categories into: No family, married only, children only, and married with children. Income level in the subject's childhood census tract was originally modeled as a continuous variable but diagnostics indicated a violation of linearity. Upon further review this was due to severe skewness rather than curvilinear or exponential relationships and the variable was dichotomized according to above or below 40% child poverty. Model fit was assessed with the log likelihood ratio chi-square and Deviance/Pearson statistics (Allison, 2012). Odds ratios and confidence intervals are reported according to “no family” as the comparison group, “married only” being the comparison group, and finally, “children only” as the comparison group. A statistically significant Odds ratio above one indicates increased likelihood while between 0 and 1 indicates decreased likelihood.

Because some of the negative adult outcomes measured were rare, albeit important, it was not possible to model them as discrete outcomes in a multivariate model. Possible outcomes were collapsed into the first of any negative outcome. Cox regression was employed to control for time from age 18 until a first negative event or end of study (Allison, 2010). Bivariate survival analyses were used both to examine key variables for multivariate analyses and to help assess for proportionality issues. Proportionality was also assessed through residual analysis. An interaction term between a variable and time was created if needed to adjust for non-proportionality in the multivariate model and retained based on significance and impact on model fit. Only in the final model examining potential moderating effects of family formation was it necessary to include a time interaction. For multivariate analyses, Cox regression models were constructed using the SURVEYPHREG option to control for clustering by census tract. Similar to the approach used for multivariate display in aim 1, Hazard Ratios, confidence intervals and model fit statistics are reported.

3. Results

Table 1 presents descriptive statistics for six categories of family formation: none, married without children, not married with one child, not married with 2 or more children, married with one child, married with 2 or more children. Significant differences between types of family formation are noted by the superscript numbers corresponding to the columns. For example, the proportion of Non-White women in the “No Family” category is different from all others except those women who are “Married with 2 or more children” as noted by the superscript numbers 2–5. White women and those who grew up in lower income census tracts were more likely to be married. Young women who grew up in the city region and those whose families received income assistance during early and later childhood were more likely to be single parents. Women who were married and/or childrearing were more likely to have histories of maltreatment and at least one stay in a runaway shelter than those who had not formed families. Women with histories of foster care were less likely to be among the “married only” group. Women with two or more children had higher rates of histories of delinquency and teen pregnancy and treatment for an STD than childless women or those with only 1 child.

3.1. Comparing Women with Histories of Poverty Only, Maltreatment Only or Both

A multinomial logistic regression was used to explore associations with family formation types collapsed into “no family”, “married only”, “children only”, and “married with children.” Odds ratios are presented in Table 2 by comparison group. Columns 2–4 categories are compared to “no family”, columns 5 and 6 categories are compared to “married only”, and column 7 is compared to “children only.” Models were first limited to indicators of childhood and family environment in the sample and then rerun controlling for indicators of adolescent risk (count variable from 0 to 5). In both models the deviance and Pearson statistics were not significant ($p > .80$). Variables with statistically significant bivariate associations were entered into the model and removed if not significant alone or in relation to the model fit. Model fit statistics are provided in Table 2 and there was a significant improvement in model fit once adolescent risk indicators were added (comparison of the two model fit statistics yielded $p < .0001$).

All other types compared to “No family” (columns 2–4)—Only race significantly predicted being married or married and childrearing compared to no family. White women were almost two times more likely to be married (column 2) and about 73% more likely to be married with at least one child. When comparing single parenting (children only) to no family, those women with both maltreatment and poverty histories were more likely to be single parents compared to women with both maltreatment and poverty histories. However, the difference between poverty alone and poverty with maltreatment became non-significant in the second model once adolescent risk indicators were controlled (see model 2, column 3). In both models, having a caretaker who had graduated from high-school reduced the likelihood of single parenting by about 25% but growing up in a neighborhood with 40% or higher rates of child poverty increased the likelihood of single parenting by about 20% (column 3). Once adolescent risk indicators were controlled, women who had childhood poverty histories only compared to histories of maltreatment and those with higher numbers

of risk indicators (over two times higher per indicator present) were more likely to be married with children compared to no family (model 2, column 4).

Compared to “married only” (columns 5 & 6)—White women and those with histories of maltreatment without childhood poverty were less likely to be single parents compared to married without children (column 5). Both childhood neighborhood poverty and number of adolescent risk indicators increased the likelihood of being a single parent compared to marriage only (column 5). Only the number of adolescent risk indicators was associated with married and childrearing as compared to married without children, increasing the likelihood of parenting by about 92% for each indicator present (model 2, column 6).

Childrearing with or without marriage (column 7)—Among women that were parenting, White women were about 2.5 times more likely to be married. Either a childhood history of poverty alone or maltreatment alone increased the likelihood of marriage compared to having both. The difference between maltreatment only and maltreatment and poverty groups became non-significant when adolescent risk was entered into the model (model 2, column 7).

3.2. Modeling Family Formation for Women with Maltreatment Histories

To address research question two, the sample was limited to those women with a childhood maltreatment history to look at age at onset, chronicity, maltreatment type, and foster care placement. Bivariate analyses (not shown) indicated significant variation between the “maltreated only” and the “maltreated with poverty” groups across several variables, therefore separate models were run for these two groups. The import of caregiver characteristics varied by group, with having a teen parent being influential for the “maltreatment only” group but having a parent graduating from high school being important in the “maltreatment with poverty” group. Further, the racial composition of the two groups varied significantly with about 70% of the maltreatment only group being White compared to about 25% of the maltreated and poor group.

Despite the interest in controlling for foster care, the cell sizes were too small to include in multivariate models. Women with prior histories of foster care were much less likely to be among the “Married only” group than all other categories ((2% vs. 15% (no family); 16% (married with children); 20% (single parenting), X^2 CMH = 9.32, $p=.002$). Poverty was highly associated with prior foster care across categories. Among single women without children, the proportion with foster care histories was almost five times higher among those with maltreatment and poverty compared to the “maltreated only” group (19.3% vs. 4.1%, $X^2 = 67.3$, $p<.0001$). Among married women with children the relationship was similar but smaller in magnitude (19.8% vs. 6.2%, Fisher’s Exact $p=.03$). Among women who were single parents, there was a similar but even less strong relationship (22.1% vs. 9.0%, $X^2 = 13.14$, $p=.0003$). Maltreatment type was not significant for either group. Within the maltreatment only subgroup there was less than a one percent difference in any family formation compared to none for those with sexual abuse or neglect histories and only a 6% higher likelihood of family formation for physical abuse cases. There were similarly small

differences for women with histories of both poverty and maltreatment. Cross-type maltreatment was common; less than 25% of women were reported solely for physical abuse or sexual abuse. Table 3 presents the odds ratios and model fit for multinomial logistic regression of family formation among women with maltreatment histories by poverty, controlling for age at maltreatment onset and number of reports over time.

3.2.1 Maltreatment Only: All other types compared to “No family” (columns 2–4)—Women with maltreatment report onset prior to age six were less likely (between 75% and nine times less depending on category) to have begun marital or childrearing responsibilities. Compared to “no family”, women whose mother was a teen parent were much more likely to be married (either with or without children; columns 2 & 4). White women were less likely to be single parents (column 3), but otherwise race was not significant. Prior to controlling for adolescent risk indicators, more maltreatment reports were associated with higher likelihood of single parenting or marriage without children, but this association disappeared once adolescent risk was controlled (columns 2 & 3). In the second model, an increase in adolescent risk indicators predicted all forms of family formation compared to no family (magnitude of 76% to nearly 4 times the risk per increase in risk factors).

“Children only” and “Married with children” compared to “Married only” (columns 5–6)—White women and those with teen mothers were less likely to be single parents compared to married without children, but after controlling for adolescent risk factors, only race remained significant (column 5). Early onset maltreatment was associated with about 4 times the likelihood of being a single parent. A greater number of adolescent risk factors was associated with childrearing within or outside of marriage compared to married only (O.R. of about 2.2 per additional risk factor, columns 5 and 6). Number of maltreatment reports decreased the likelihood of being married with children compared to married only by about 88% per report up to 4 reports once adolescent risk was controlled.

“Married and children only” compared to “Children only” (column 7)—Among women with children, White women were about three times more likely to be married. Early onset of maltreatment was associated with a decreased likelihood of being married (about 4 times less).

3.2.2 Maltreatment & Poverty: All other types compared to “no family” (columns 2–4)—White women were more likely to be married and less likely to be single parents compared to having “no family”. Having had a parent with a high school diploma decreased the likelihood of being a single parent even after controlling for adolescent risk (columns 3, model 2). Similar to the “maltreatment only” group, early age at onset of maltreatment reports was associated with a decreased likelihood of all types of family formation (model 2, columns 2–4). In the final model with adolescent risk factor controls, increased number of maltreatment reports was associated with an increased likelihood of “marriage only” compared to “no family” and a very slight decrease in single parenting. Adolescent risk indicators were associated with increased likelihood of childrearing (married or not) but no increased risk of marriage compared to “no family”.

“Children only” and “Married with children” compared to “Married only”

(columns 5–6)—White women were less likely to be single parents than married without children (about 4 times lower; column 5). Number of maltreatment reports was associated with decreased likelihood of having children compared to married only while the number of adolescent risk indicators was associated with an increased likelihood of having children (regardless of marital status) compared to married only (columns 5 & 6).

“Married and children only” compared to “Children only” (column 7)

—This model was nearly identical to the model limited to women with maltreatment only. Race had a slightly lower magnitude association and early onset of maltreatment report had a somewhat stronger association (compare top two sections with bottom two sections).

3.3. Negative Young Adult Functioning and Family Formation

Table 4 presents various adult outcomes by family formation category. Women with two or more children (irrespective of marriage) were more likely to have adult health records for chronic conditions or obesity and more likely to have a record of report as an alleged perpetrator of abuse or neglect than women in categories of “no family”, “married only”, “single parent with one child” or “married with one child” in the sample. Emergency room treatment for domestic violence and adult arrest rates were also highest for this group, though only statistically significant from “no family” for both outcomes. Adult mental health treatment was highest for married women with two or more children, but this was only statistically significant as compared to “no family”, “married only”, or “single parent with 1 child” categories. There was no apparent bivariate trend in a protective role of marriage compared to no family formation or marriage with children compared to single parenting at the bivariate level.

Because indicators of problems in adult functioning may vary in time order and there was no judgment made about the severity of a given indicator, a Cox regression approach was used to model time in months from age 18 to first occurring negative indicator. Bivariate survival analyses (not shown) were used for selection of model variables outside family formation as well as testing of proportionality. Variables significant at the bivariate level were entered using a hierarchical modeling approach: (Model 1) demographics and maltreatment or poverty history, (Model 2) control for count of adolescent risk indicators; and (Model 3) family formation categories. Because women who were parenting might have differential risk of maltreatment perpetration, to be conservative, the model was rerun excluding child maltreatment perpetration as a possible outcome; only the final model is shown (see Model 4). Across models, histories of poverty only or maltreatment only were associated with a decreased risk of a negative outcome compared to women with both maltreatment and poverty histories. The risk of a negative adult outcome increased by about 46% per adolescent risk indicator after controlling for family formation (Models 3 & 4), White women had about a 20% higher risk of an indicator of a negative adult outcome (Models 3 & 4). Childrearing alone or with marriage was associated with an increased risk of a negative outcome compared to having no family, even after removing child maltreatment perpetration as an outcome (Model 4). While the main effect for “married only” compared to no family was not significant, an interaction between marriage without children and time indicated a

gradual increase in risk per month so that by age 26 the risk of any poor outcome would be slightly higher for women in the “married only” group than that of women without early family responsibilities.

4. Discussion

The present study examined family formation among women with childhood histories of maltreatment and/or poverty. Before controlling for adolescent risk indicators, our models partially supported the hypothesis that young women with a history of “poverty only” or “maltreatment only” have a lower likelihood of unmarried childrearing than women with both poverty and maltreatment histories. These findings are consistent with the idea of the impact of cumulative risk (Jonson-Reid et al., 2012) as both poverty (Cherlin et al., 2004) and childhood maltreatment (Garwood et al., 2015; Southerland et al., 2009) have been associated with unmarried childrearing. Following control for the number of adolescent risk indicators, however, only the “maltreatment only” group remained significantly different than the group with both experiences. Across all categories, number of adolescent risks had the strongest association with childrearing compared to “no family.” This finding is consistent with two prior studies suggesting that early social risk behaviors are linked to early family responsibilities (Oxford et al., 2005; Wickerama et al., 2003).

Our findings in regards to the association between race and marriage are consistent with prior studies (Banks, & Gatlin, 2005) and regional statistics (City of St Louis, Department of Health, 2012). A cautionary note, however, is important in regard to the intersection of race and class. We did not have a non-poor and non-maltreated comparison group in the present study. Within the maltreatment sample, race was heavily associated with poverty and nearly 84% of the poverty only group was African American. African American children are more likely to be poor and are much more likely to live in high poverty neighborhoods (Drake, & Rank, 2009). While much of the literature on marriage and childrearing unmarried relates to poverty rather than race (Coyne, & D’Onofrio, 2012; Meade et al., 2008; Whitehead, 2009), the two constructs are difficult to separate in the present study.

4.1 Women with histories of maltreatment

Among women with maltreatment histories, we examined type of maltreatment, chronicity, age at onset of reporting and having spent time in foster care. Type of maltreatment was not associated with family formation, but the outcomes in the present study are not completely comparable to existing published work. Literature on maltreatment type differences is typically limited to sexual risk behaviors (Brown et al., 2004; Hahm et al., 2010; Negri, Schniederman, & Trickett, 2015), which may or may not result in later childrearing. Two studies have found sexual abuse and neglect to be associated with childbearing, but both studies were limited to teenage childbearing risk (Noll, & Shenk, 2013; Thompson, & Neilson, 2014). Further cross-type occurrence is common in longitudinal studies, which can complicate trying to tease out the impact of a particular type of maltreatment (Jonson-Reid, Drake, Chung, & Way, 2003; Kim, Mennen, & Trickett, 2016).

A younger age at onset appeared to reduce the likelihood of early family formation. This is somewhat consistent with Southerland and colleagues (2009) although the samples and

measures of maltreatment timing vary. While many studies focus on the import of maltreatment during the early years, others have argued that maltreatment during adolescence may place youth at higher risk of various adolescent risk behaviors (Smith, Ireland, & Thornberry, 2005; Thornberry, Ireland, & Smith, 2001). The association with adolescent risk factors remained significant in models specific to women with maltreatment histories.

Multiple reports of maltreatment and placement into care (although foster care could not be evaluated in the multivariate model) appear to be most salient for young women who were also raised in poor families. The proportion of women with foster care histories in the non-poor group was too small to allow for multivariate investigation. However, King and colleagues (2014) found a small difference in teen childrearing by foster care history which was similar to the small difference between no family and the combined parenting groups in the present study. The relationship between increased reports and single parenthood compared to “no family” is somewhat counter to the literature on risky behaviors and chronic maltreatment (Jonson-Reid, et al., 2012). On the other hand, most studies of early childrearing focus on the onset of teenage parenting rather than parenting in adulthood and have not had the same controls for adolescent risk indicators, poverty and age at onset. Nor was it possible to assess whether or not repeated contacts with child welfare could have influenced the likelihood of referral for health services that may have included contraception. Clearly more work is required to tease out issues of maltreatment, risky behaviors and family formation that is not limited to teen parenting.

4.2 Family formation and negative adult outcomes

Regarding our second aim, there was little variation in the likelihood of negative adult outcomes between women in marital relationships without children and those who had not yet formed families. This is consistent with literature suggesting that marriage may not confer the same benefits in low income and vulnerable populations, particularly if family formation occurs too early (Coyne, & D’Onofrio, 2012; Lichter et al., 2003; Meade et al., 2008; Whitehead, 2009; Wickerama et al., 2003). Within this population being married without children was quite rare (only 2.2%) and being married with children still unusual (5.4%). The low rate of marriage compared to what might be expected given the population median age of 27 for women (U.S. Census Bureau, 2014) is consistent with prior studies of poverty and marriage (Edin, & Reed, 2005; Lichter et al., 2003).

Having a child, whether married or not, increased the risk of negative outcomes. Delaying marriage and/or parenthood until completing an education and finding secure employment improves the outcomes related to psychosocial functioning in adulthood (Bozick, & DeLuca, 2005; Cohen, Kasen, Chen, Hartmark, & Gordon, 2003; Meier, & Allen, 2008). Having a child early, particularly when unplanned, may make a healthy transition to adulthood more challenging given the increased stress and economic demands associated with parenting (Herd et al., 2016; Lichter et al., 2003).

Separate from maltreatment and poverty history, indicators of emotional and behavioral problems prior to age 18 were significant predictors of young adult childrearing and of later negative adult outcomes (Bender, 2010; Bright, et al., 2014; Jonson-Reid et al., 2012; Noll,

& Shenk, 2013; Oxford et al., 2005; Wickerama et al., 2003). Although some prior research suggests that the lasting effects of maltreatment may overwhelm the buffering impact of marriage (Allwood, & Widom, 2013; MacMillan, et al., 2001; Sperry, & Widom, 2013), the fact that both the poverty only and maltreated only groups fared better than women with both histories is more suggestive of a cumulative risk model (Chartier et al., 2010; Edwards et al., 2003). It is unclear to what extent the additional role of adolescent risk factors offers further support for cumulative risk as compared to being intermediary outcomes that set in play a series of behavioral adaptation that persist into young adulthood (Liu et al., 2010).

4.1 Limitations and Implications for Future Research

While this study is able to contribute to a scant literature on family formation and later outcomes related to a childhood history of maltreatment and poverty, there are several limitations that should lead to future study. Administrative data captures only those individuals known to systems providing the data and it is unknown to what degree our findings may generalize to individuals experiencing similar problems (maltreatment, mental health, etc.) without associated system involvement. Further, administrative data typically offers limited information on protective factors, attitudes and expectations, or emotional states. In future studies, strengths of both administrative data and targeted survey information could be combined to capitalize on the ability to study rare events in large populations over time while still gathering more detailed information about the developmental mechanisms at play and variation for detected compared to undetected problems in a population. Due to the limitation of data on partner formation to marriage records, it was impossible to examine relevant related issues such as marital satisfaction or intimate partner violence (Lee et al., 2015; Whisman, 2006), or the effect of unmarried but cohabitating partnerships. Given the changes in restrictions on marriage, it should become easier for future studies using administrative data to include same sex partnerships, although studying cohabitation will still likely require some form of survey research. Sources of information on intimate partner violence are often limited to shelter populations outside of large scale population surveys. As some states develop innovative collaborative approaches to addressing the overlap between IPV and child welfare, this may improve the ability to measure this important factor.

While the present study was limited to women due to lack of reliable recording of fathers on birth records, literature does suggest gender variation in response to maltreatment during adolescence (Horan, & Widom, 2015; Negri, Saxbe, & Trickett, 2015; Negri, Schneiderman, & Trickett, 2015; Schneiderman, Negri, & Trickett, 2016; Topitzes, Mersky, & Reynolds, 2012).

It will be important for future research to explore family formation across gender and sexual orientation. It was also not possible to assess the current income of the young women so it is unclear to what extent poverty persists into young adulthood. As reviewed earlier, some theorize that the relationship between family formation and poverty outcomes is driven by childhood poverty conditions while other models suggest that family formation poses barriers to economic opportunity (Edin, & Reed, 2005; Lichter et al., 2003; Thornberry et

al., 2015). It is hoped that future studies will be able to include measures of socioeconomic status throughout the life course to better understand this complex relationship.

4.2 Conclusion and Implications for Practice

Outside of teenage childbearing or risky sexual behaviors there has been little quantitative work to understand family formation in young adults with histories of maltreatment and/or poverty and how that may be associated with adult functioning in other domains. Generally, this study suggests that early family formation, particularly childbearing, is associated with a variety of negative outcomes for many young women with childhood histories of maltreatment and/or poverty. First, this suggests a cautionary note regarding the explicit assumption in policies aimed at promoting marriage that this is always a positive option for women (Catlett, & Artis, 2004; Lichter et al., 2003; Lichter, Qian, & Mellott, 2006). Additionally, our findings suggest possible implications for pregnancy prevention. While poverty influences the timing of motherhood, this relationship need not be inevitable. Prevention of early and unplanned births among lower income and women with histories of trauma may improve the chances for young women to achieve goals in education, the workforce and positive intimate partnerships that may in turn decrease the likelihood of negative health and behavioral outcomes in adulthood (Herd et al., 2016; Terry-Humen, Papillo, Franzetta, Williams, & Ryan, 2002). It may be possible to evaluate this hypothesis by combining longitudinal investigation of outcomes with data on the provision of effective pregnancy prevention programming.

Additionally, while the prevention of poverty and maltreatment are obviously preferable, our study suggests significant potential benefit associated with secondary prevention of various adolescent emotional and behavioral problems. Evidence-based practices focused on prevention of mental health or behavioral problems following trauma are available and should be a priority for this population. As the movement toward trauma informed systems gains momentum (Ko et al., 2008), such programming may become more readily available. It is hoped that the present study will encourage further work in this area that includes the testing of various preventive and intervention approaches.

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Highlights

- Among women with childhood maltreatment histories, early onset maltreatment was associated with childrearing or marriage compared to no family.
- Among previously maltreated women, predictors of family formation varied according to prior poverty history.
- Having children with or without marriage was associated with a higher risk of negative outcomes
- Indicators of adolescent risk behaviors were significant predictors of young adult childrearing and later negative adult outcomes.
- Preventing early and unplanned births among young adult women could allow them to acquire higher levels of education, obtain better quality employment, and form more stable relationships with intimate partners.
- Secondary prevention of various emotional and behavioral disorders among young adults with childhood history of maltreatment and/or poverty is warranted.

Table 1
Family Formation by Demographics, Family Poverty, Maltreatment & Youth System Contact

Formation Column #s	1	2	3	4	5	6
	No Family n=2645	Married No Child n=95	1 Child not married n=835	2+ Children Not married n=584	Married 1 Child n=109	Married 2+ Children n=117
Race						
NonWhite	67.9 ²⁻⁵	46.3 ^{1,3,4,6}	76.3 ^{1,4-6}	82.4 ^{1-3,5,6}	52.3 ^{1,3,4}	60.7 ²⁻⁴
WH	32.1	53.7	23.7	17.6	47.7	39.3
City Resident						
Yes	54.3 ²⁻⁴	38.9 ^{1,3,4,6}	61.9 ^{1,2,5}	66.8 ^{1,2,5,6}	50.5 ^{3,4}	53.0 ^{2,4}
No	45.7	61.0	38.1	33.2	49.5	47.0
Parent HS						
Yes	57.2 ^{3,4}	57.9 ³	52.2 ^{1,2}	49.5 ¹	59.6	49.7
No	42.8	41.1	47.8	50.5	40.7	51.3
Family Income Assistance						
Never	14.5 ^{3,4}	22.0 ^{4,6}	5.6 ^{1,5}	5.0 ^{1,2,5}	16.5 ^{3,4}	12.0 ²
Prior to age 5 only	5.1 ³⁻⁶	1.0	1.1 ^{1,4}	0.0 ^{1,3}	0.9 ¹	0.0 ¹
Age 5 to 17	3.4 ^{2,6}	9.5 ^{1,3,4}	4.2 ²	4.1 ²	5.5	7.7 ¹
Both	77.0 ²	67.5 ^{1,3,4,6}	89.1 ^{1,2,5,6}	90.9 ^{2,5}	77.1 ^{3,4}	80.3 ^{2,3}
40% or more Child Poverty						
Yes in Tract	41.4 ²⁻⁴	25.3 ^{1,3,4,6}	50.4 ^{1,2,5}	55.3 ^{1,2,5,6}	37.6 ^{3,4}	41.0 ^{2,4}
No in Tract	58.6	74.7	49.6	44.7	62.4	59.0
Age in years at Study End	21.1 ²⁻⁶	23.7 ^{1,3}	21.8 ^{1,2,4-6}	23.9 ^{1,3}	23.4 ^{1,3}	24.1 ^{1,3}
Parent age at subject birth	24.3	24.4	23.7	23.2	23.6	24.0
Number Malt Rept						
0	30.4 ^{3,4}	24.2	26.0 ^{1,4}	23.1 ^{1,3,5}	23.8 ⁴	26.5
1	33.7	26.3	30.8	25.5	37.6	32.5
2	14.2	18.9	16.5	16.3	15.6	15.4
3	7.6	12.6	8.5	11.0	8.3	5.1
4+	14.2	17.9	18.2	24.1	14.7	20.5

Formation	Column #s	1	2	3	4	5	6
		No Family n=2645	Married No Child n=95	1 Child not married n=835	2+ Children Not married n=584	Married 1 Child n=109	Married 2+ Children n=117
Ever Foster Care							
Yes		10.5 ²⁻⁴	2.1 ^{1,3-6}	13.4 ^{1,2,4}	18.5 ^{1-3,6}	14.7 ²	10.3 ^{2,4}
No		89.4	97.9	18.7	81.5	85.3	89.7
Health Tx for Teen Pregnancy							
Yes		1.8 ²⁻⁶	5.3 ^{1,3-6}	37.1 ^{1,2,4,6}	66.8 ^{1-3,5}	28.4 ^{1,2,4,6}	59.0 ^{1-3,5}
No		98.1	94.7	62.9	33.2	71.6	41.0
Runaway Shelter							
Yes		3.2 ²⁻⁶	7.4 ¹	8.6 ^{1,4}	12.0 ^{1,3}	12.8 ¹	11.1 ¹
No		96.7	92.6	91.4	88.0	87.2	89.9
Delinquency Pet							
Yes		16.2 ³⁻⁶	14.7 ^{3,4,6}	30.4 ^{1,2,4}	43.7 ^{1-3,5,6}	23.8 ^{1,4}	33.3 ^{1,2,4}
No		83.8	85.3	69.6	56.3	76.1	66.7
MH Tx<age 18							
Yes		26.2 ³⁻⁶	32.6	34.5 ¹	37.5 ¹	34.9 ¹	35.0 ¹
No		73.8	67.4	65.5	62.5	65.1	65.0
STD Tx<18 yrs							
Yes		5.3 ^{3,4,6}	2.1 ^{3,4,6}	11.5 ^{1,2,4,5}	15.2 ^{1-3,5}	3.7 ^{3,4}	10.3 ^{1,2}
No		94.7	97.9	88.5	84.8	96.3	89.7

Superscripts indicate statistically significant differences at the p<.05 level (e.g., "1,3" indicates that the value is statistically significantly different from columns 1 and 3 in the same row).

Table 2

Multinomial Regression of Family Formation: Full Sample

	Compared to Not Married and No Children			Compared to Married Only			Compared to Children Only		
	Married Only	Children Only	Married & Children	Children Only	Married & Children	Married & Children	Children Only	Married & Children	Married & Children
<i>African American</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
White	1.95 (1.2–3.2)	0.68(0.6–0.8)	1.73(1.2–2.4)	0.35 (0.2–0.6)	0.88(0.5–1.6)	2.53 (1.8–3.6)	0.35 (0.2–0.6)	0.88(0.5–1.6)	2.53 (1.8–3.6)
<i>Poor & maltreated</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Poor Only	0.90(0.4–2.1)	0.61(0.5–0.8)	1.18(0.7–1.9)	0.67(0.3–1.6)	1.31(0.5–3.5)	1.94(1.2–3.2)	0.67(0.3–1.6)	1.31(0.5–3.5)	1.94(1.2–3.2)
Maltreated Only	1.29(0.7–2.7)	0.37(0.2–0.5)	0.70(0.4–1.2)	0.29(0.1–0.6)	0.54(0.2–1.3)	1.86(1.0–3.5)	0.29(0.1–0.6)	0.54(0.2–1.3)	1.86(1.0–3.5)
<i>Parent no HS</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
HS or above	0.99 (0.5–1.9)	0.77(0.6–0.9)	0.98(0.7–1.4)	0.77(0.4–1.5)	0.99(0.5–2.0)	1.28(0.8–1.9)	0.77(0.4–1.5)	0.99(0.5–2.0)	1.28(0.8–1.9)
Child tract poverty									
Below 40%	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
40% or above	0.69 (0.4–1.2)	1.21(1.1–1.4)	1.11(0.8–1.5)	1.75 (1.0–3.0)	1.61(0.9–3.0)	0.92(0.7–1.3)	1.75 (1.0–3.0)	1.61(0.9–3.0)	0.92(0.7–1.3)
Interaction									
Graduate*maltonly	0.91 (0.3–2.4)	1.75(1.1–2.7)	1.35(0.7–2.8)	1.92(0.7–5.3)	1.47(0.5–4.7)	0.77(0.3–1.7)	1.92(0.7–5.3)	1.47(0.5–4.7)	0.77(0.3–1.7)
Graduate*pooronly	1.19 (0.4–3.6)	1.04(0.8–1.4)	0.54(0.3–1.0)	0.87(0.3–2.6)	0.45(0.1–1.5)	0.52(0.3–1.0)	0.87(0.3–2.6)	0.45(0.1–1.5)	0.52(0.3–1.0)
<i>Model One Fit</i>	LLS Chi-sq=212.81, df=21, <.0001								
<i>African American</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
White	1.96(1.2–3.2)	0.71(0.6–0.9)	1.80(1.3–2.5)	0.36(0.2–0.6)	0.91(0.5–1.6)	2.52(1.8–3.6)	0.36(0.2–0.6)	0.91(0.5–1.6)	2.52(1.8–3.6)
<i>Poor & maltreated</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Poor Only	0.98(0.4–2.4)	0.98(0.8–1.3)	1.81(1.1–2.9)	1.00(0.4–2.5)	1.85(0.7–4.9)	1.85(1.1–3.0)	1.00(0.4–2.5)	1.85(0.7–4.9)	1.85(1.1–3.0)
Maltreated Only	1.42 (0.7–2.9)	0.61(0.4–0.9)	1.10(0.6–1.9)	0.43(0.2–0.9)	0.78(0.3–1.9)	1.80(0.9–3.4)	0.43(0.2–0.9)	0.78(0.3–1.9)	1.80(0.9–3.4)
<i>Parent no HS</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
HS or above	1.0(0.5–1.8)	0.81(0.7–0.9)	1.0(0.7–1.5)	0.80(0.4–1.5)	1.02(0.5–2.1)	1.27(0.9–1.9)	0.80(0.4–1.5)	1.02(0.5–2.1)	1.27(0.9–1.9)
Child tract poverty									
Below 40%	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
40% or above	0.69(0.4–1.2)	1.19(1.0–1.4)	1.11(0.8–1.5)	1.73(1.0–2.9)	1.61(0.8–2.9)	0.93(0.7–1.3)	1.73(1.0–2.9)	1.61(0.8–2.9)	0.93(0.7–1.3)
# Adolescent Risk									
Indicators (0–5)	1.23(0.9–1.6)	2.54(2.3–2.7)	2.37(2.1–2.7)	2.05(1.6–2.7)	1.92(1.4–2.5)	0.94(0.7–1.1)	2.05(1.6–2.7)	1.92(1.4–2.5)	0.94(0.7–1.1)

Compared to Not Married and No Children			Compared to Married Only		Compared to Children Only	
Married Only			Children Only	Married & Children	Children Only	Married & Children
Interaction						
Graduate*malonly	0.88 (0.3–2.3)	1.58(1.0–2.5)	1.23(0.6–2.6)		1.80(0.6–5.0)	0.78(0.4–1.7)
Graduate*pooronly	1.19 (0.4–3.5)	1.06(0.8–1.5)	0.56 (0.3–1.1)		0.90(0.3–2.7)	0.52(0.3–1.0)
<i>Model Two Fit</i> LLS Chi-sq=903.69, df=24, <.0001						

Italics indicate comparison for categorical variables. **Bold** indicates statistical significance. 95% CI in parentheses

Table 3

Multinomial Regression of Family Formation: Women with Maltreatment History

Non-Poor Maltreatment Model					
Compared to Not Married and No Children			Compared to Married Only		
	Married Only	Children Only	Married & Children	Children Only	Married & Children
<i>African American</i>	1.0	1.0	1.0	1.0	1.0
White	1.95(0.8–5.0)	0.55(0.4–0.8)	1.56(0.8–3.2)	0.28(0.1–0.7)	2.83(1.3–6.1)
<i>Parent was Teenmom</i>	1.0	1.0	1.0	1.0	1.0
Yes	4.26(1.4–12.6)	1.25(0.6–2.8)	2.99(1.1–8.0)	0.29(0.1–0.9)	2.39(0.8–7.3)
<i>Maltreatment onset</i>	1.0	1.0	1.0	1.0	1.0
Before Age 6	0.13(0.04–0.4)	0.46(0.3–0.7)	0.11(0.04–0.3)	3.67(1.0–12.9)	0.23(0.1–0.7)
# Malt Reports(1–4+)	1.56(1.1–2.2)	1.41(1.2–1.7)	1.05(0.7–1.4)	0.90(0.6–1.3)	0.75(0.5–1.1)
Model Fit LLS Chi-sq=93.11, df=12, <.0001					
<i>African American</i>	1.0	1.0	1.0	1.0	1.0
White	1.96(0.8–5.0)	0.57(0.4–0.9)	1.71(0.8–3.6)	0.29(0.1–0.8)	2.99(1.4–6.4)
<i>Parent was Teenmom</i>	1.0	1.0	1.0	1.0	1.0
Yes	4.45(1.5–13.3)	1.40(0.6–3.4)	3.49(1.2–9.8)	0.31(0.1–1.1)	2.48(0.8–7.7)
<i>Maltreatment onset</i>	1.0	1.0	1.0	1.0	1.0
Before Age 6	0.12(0.04–0.4)	0.57(0.4–0.9)	0.13(0.04–0.4)	4.55(1.3–16.2)	0.23(0.1–0.7)
# Malt Reports(1–4+)	1.41(0.9–2.0)	0.99(0.8–1.2)	0.74(0.5–1.1)	0.70(0.5–1.0)	0.75(0.5–1.1)
# Adolescent Risk					
Indicators (0–5)	1.76(1.1–2.9)	3.87(2.9–5.1)	3.9(2.7–5.7)	2.21(1.3–3.8)	1.01(0.7–1.4)
Model Fit LLS Chi-sq=224.34, df=15, <.0001					
Poverty & Maltreatment Model					
<i>African American</i>	1.0	1.0	1.0	1.0	1.0
White	2.77 (1.5–5.1)	0.66(0.5–0.8)	1.76(1.2–2.6)	0.24(0.1–0.4)	2.66(1.8–4.0)
<i>Parent was HS Grad</i>	1.0	1.0	1.0	1.0	1.0
Yes	1.1(0.6–2.0)	0.74(0.6–0.9)	0.94(0.6–1.4)	0.70(0.4–1.3)	1.26(0.8–1.8)

Non-Poor Maltreatment Model							
Compared to Not Married and No Children				Compared to Married Only		Children Only	
Married Only	Children Only	Married & Children	Children Only	Married & Children	Children Only	Married & Children	Children Only
<i>Maltreatment onset</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Before Age 6	0.28(0.14–0.6)	0.41(0.3–0.5)	0.16(0.1–0.3)	1.47(0.7–3.0)	0.56(0.2–1.3)	0.38(0.2–0.6)	
# of Malt Reports(1–4+)	1.30(1.0–1.7)	1.1 (1.1–1.2)	1.2 (0.9–1.4)	0.89(0.7–1.1)	0.90(0.7–1.2)	1.0(0.9–1.2)	
Model Fit	LLS Chi-sq=209.48, df=12, <.0001						
<i>African American</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0
White	2.85(1.5–5.3)	0.72(0.6–0.9)	1.87(1.2–2.8)	0.25(0.1–0.5)	0.65(0.3–1.3)	2.60(1.7–3.9)	
<i>Parent no HS</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0
HS or above	1.10(0.6–2.1)	0.74(0.6–0.9)	0.92(0.6–1.3)	0.67(0.3–1.2)	0.83(0.4–1.7)	1.24(0.8–1.8)	
<i>Maltreatment onset</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Before Age 6	0.26(0.1–0.5)	0.46(0.4–0.6)	0.18(0.1–0.3)	1.74(0.8–3.6)	0.67(0.3–1.6)	0.38(0.2–0.6)	
# of Malt Reports(1–4+)	1.36(1.0–1.8)	0.91(0.8–0.9)	0.94(0.8–1.1)	0.67(0.5–0.9)	0.69(0.5–0.9)	1.0(0.9–1.2)	
# Adolescent Risk							
Indicators (0–5)	0.85(0.6–1.3)	2.37(2.1–2.6)	2.2(1.8–2.6)	2.78(1.9–4.1)	2.58(1.7–3.9)	0.93(0.8–1.1)	
Model Fit	LLS Chi-sq=579.28, df=15, p <.0001						

Italics indicate comparison for categorical variables. **Bold** indicates statistical significance. 95% CI in parentheses

Table 4

Family Formation by Adult Outcomes of Concern

Column #	1	2	3	4	5	6
	No Family	Married Only	1 Child Not Married	2+ Children Not Married	1 Child Married	2+ Children Married
No Negative Outcome	88.7 ²⁻⁶	78.9 ^{1,4-6}	71.3 ^{1,4,6}	56.5 ^{1-3,5}	72.5 ^{1,4}	55.6 ¹⁻³
Death	0.45	0	0.84	0.51	0.92	0
Tx for Serious/Chronic Health	0.83 ^{3,4,6}	1.0 ^{4,6}	4.67 ^{1,4,6}	8.90 ^{1-3,5}	2.75 ⁴	11.97 ¹⁻³
Alleged CAN perp. ^a	0.04 ²⁻⁶	1.0 ^{1,3-6}	7.66 ^{1,2,4,6}	20.0 ^{1-3,5}	8.26 ^{1,2,4}	15.38 ¹⁻³
Adult Arrest	3.97 ^{3,4}	3.16	8.02 ¹	9.1 ¹	3.67	6.0
ER Tx for DV ^b	0.19 ⁴	1.0	0.24 ⁴	1.71 ^{1,3}	0.92	0.85
Adult MH Tx ^c	6.92 ²⁻⁶	15.8 ¹	12.8 ^{1,4,6}	20.0 ^{1,3}	18.4 ¹	26.5 ^{1,3}

Tx=treatment;

^a =reported as alleged child abuse and/or neglect perpetrator;^b =a record of emergency room treatment for domestic violence;^c =record of mental health treatment in adulthood.

Superscripts indicate statistically significant differences at the p<.05 level (e.g., "1,3"; indicates that the value is statistically significantly different from columns 1 and 3 in the same row).

Table 5
Risk of Any Negative Outcome in Adulthood by Family Formation, Maltreatment & Adolescent Risk Indicators

	Model 1		Model 2		Model 3		Model 4 (exclude Malt Perpetration)	
	Hazard Ratio	CI	Hazard Ratio	CI	Hazard Ratio	CI	Hazard Ratio	CI
<i>African American</i>	1.00		1.00		1.00		1.00	
White	1.12	0.9–1.3	1.18	0.9–1.4	1.21	1.0–1.4	1.23	1.0–1.5
Age at End	0.99	0.9–1.0	0.97	0.9–1.0	0.96	0.9–1.0	0.96	0.9–0.9
<i>Poor & maltreated</i>	1.00		1.00		1.00		1.00	
Poor Only	0.56	0.5–0.7	0.79	0.7–0.9	0.79	0.7–0.9	0.80	0.7–0.9
Maltreated Only	0.55	0.4–0.7	0.76	0.6–0.9	0.80	0.6–0.9	0.81	0.7–0.9
# Adol Risk (0–4+)			1.60	1.5–1.7	1.46	1.4–1.5	1.47	1.4–1.6
<i>No family</i>			1.00		1.00		1.00	
Married only			0.52	0.2–1.2	0.52	0.2–1.2	0.52	0.2–1.2
Child only			1.84	1.6–2.1	1.84	1.6–2.1	1.57	1.3–1.8
Married w/child			1.67	1.3–2.1	1.67	1.3–2.1	1.51	1.2–1.9
Interactions								
Marry only*time			1.02	1.0–1.03	1.02	1.0–1.03	1.02	1.0–1.03
<i>Model fit 1</i>	Wald χ^2 =70.10, df=4, p<0001							
<i>Model fit 2</i>	Wald χ^2 =382.89, df=5, p<0001							
<i>Model fit 3</i>	Wald χ^2 =472.21, df=9, p<.0001							
<i>Model fit 4</i>	Wald χ^2 =387.9, df=9, p<.0001							

Bold indicates statistical significance