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Longitudinal Predictors of Homelessness: Findings from the National Longitudinal Survey of Youth-97

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Abstract

Homeless youth represent a vulnerable and understudied population. Little research has prospectively identified factors that may place youth at risk for experiencing homelessness. The current study utilizes data from the National Longitudinal Survey of Youth-97 (NLSY-97) to examine predictors of experiencing homelessness as a young adult (before age 25). The NLSY-97 includes a nationally representative sample of 8,984 youth. Data were first collected from these youth when they were between the ages of 12 to 18 years. The current study examined whether individual and family risk factors reported during adolescence predict homelessness by the age of 25. The findings showed that multiple runaway episodes, non-traditional family structure, lower educational attainment, and parental work limitations due to health increased the risk of homelessness. A permissive parenting style and being Hispanic protected against homelessness. This study offers unique insight into risk and protective factors for youth homelessness, and has important clinical implications.

An estimated 4.6 to 7.6% of adolescents and young adults experience homelessness in the United States, and over 75,000 youth experience homelessness in the United Kingdom annually (Ringwalt, Greene, Roberston, & McPheeters, 1998; Shelton, Taylor, Bonner, & van den Bree, 2009; van den Bree et al., 2009). These youth represent a vulnerable and understudied population. Once living on the streets, homeless youth are exposed to high rates of victimization and delinquent activity and may become involved in a subculture of street life leading to greater difficulty exiting the streets (Auerswald & Eyre, 2002; Gaetz, 2004; Tyler, Hoyt, & Whitbeck, 2000). Given the immediate risks and lasting negative impact of youth homelessness, identification of youth who are at risk of becoming homeless is critical for prevention efforts (Auerswald & Eyre, 2002; Gaetz, 2004). Problems associated with the family, as well as various behavioral problems among youth, have been

associated with homelessness (Robertson & Toro, 1999; Toro, Dworsky, & Fowler, 2007). However, most studies have relied on convenience samples of currently homeless youth. Little information is available regarding those factors that place non-homeless youth at-risk of experiencing future homelessness (Tyler, Hagewen, & Melaneder, 2011).

Only two population-based, prospective studies of homeless youth were identified, and both were conducted with the same sample of youth. Shelton and colleagues (2009), as well as Van den Bree and colleagues (2009), used the National Longitudinal Study of Adolescent Health (Add Health) and found that family, economic, school, and behavior problems during adolescence predicted homelessness as a young adult. The current study seeks to further substantiate and expand upon these findings by prospectively examining family and individual characteristics assessed during the ages of 12 to 18 years that may predict homelessness by age 25 using a different population based data set: the National Longitudinal Survey of Youth-97 (NLSY-97). Both data sets are national probability samples of youth, but there are differences. Regarding sampling, the Add Health is a school-based sample of U.S. students in grades 7-12 in 1994-1995. The NLSY97 is a nationally representative sample of youth who were born in 1980—1984 and living in the U.S. in 1997, and is not a school-based sample. Considering that runaway and homeless youth have higher rates of school drop-out (Arandi & Cooper, 2012; Thompson, Kost, & Pollio, 2003; Toro & Goldstein, 2000), the Add Health dataset likely misses some youth who dropped out of school in their high school years, and thus does not sample some youth most at risk for homelessness in early adulthood. In addition, although both datasets over-sampled Hispanic and non-Hispanic Blacks, the Add Health oversampled non-Hispanic Blacks from well-educated families, whereas the NLSY97 oversampled a more typical group of Hispanic and non-Hispanic Blacks. The Add Health data set has the advantage of better health measures, but the NLSY97 sample will likely better capture runaway and homeless youth.

Experiences of Homeless Youth in the United States and the United Kingdom

Homeless youth in the United States and United Kingdom experience similar vulnerabilities (Robertson & Toro, 1999; Quilgars, Johnsen, & Pleace, 2008). Homeless youth often come from disadvantaged and dysfunctional homes, with youth reporting high rates of sexual and physical abuse (Robertson and Toro, 1999; Quilgars et al., 2008). In addition to family problems, these youth are more likely to experience mental health problems, with 23 to 67% of youth meeting criteria for a mental health diagnosis (Cauce et al., 2000; Quilgars et al., 2008). Furthermore, mental health problems are often exacerbated by youth's substance use, and youth's substance use may increase as a result of living on the streets (Goulden & Sondhi, 2001; Quilgars et al., 2008). Additionally, youth living on the streets experience high rates of victimization. Stewart and colleagues (2004) estimated that 83% of homeless youth experience physical and/or sexual assault after leaving home. Homeless youth's early experiences of trauma are often followed by further victimization, thus aggravating mental health and substance use problems (Robertson & Toro, 1999; Quilgars et al., 2008). In sum, identifying youth at risk for homelessness and intervening before they become homeless is

critical because it may allow for the prevention of further trauma and increased mental health and substance use problems.

Relationship between Runaway Adolescents and Homeless Youth

Running away from home is a fairly common occurrence. Within the UK it is estimated that 1 in 9 youth will away before the age of 16 (Social Exclusion Unit, 2002), while an estimated 1.7 million youth in the US run away annually (Hammer, Finkelhor, & Sedlak, 2002). Runaway experiences as an adolescent may be one of the strongest predictors of youth homelessness, with many homeless individuals reporting previous run away experiences (Fothergill, Doherty, Robertson, & Ensminger, 2012; Shelton et al, 2009; Simons & Whitbeck, 1991). While the majority of adolescents who run away return home in less than a month (Hammer et al., 2002), many youth also report multiple runaway episodes (Pergamit, 2010). Youth with multiple runaway episodes generally report more severe individual and family problems than those that report one runaway episode (Baker et al., 2003; Thompson & Pillai, 2006), and may be most at risk of future homelessness.

The age at which a youth first runs away may also influence their future homeless experiences. For example, Yoder and colleagues (2001) found that age at first run was positively associated with an increased risk of spending time on the streets. Running away at an earlier age may be indicative of more severe family problems, with previous research finding that youth who run away at an earlier age are more likely to experience neglect and abuse than youth who run away at a later age (Thrane, Hoyt, Whitbeck, & Yoder, 2006).

While previous studies have demonstrated that there is an overlap among runaway and homeless populations (Fothergill et al., 2012; Shelton et al., 2009; Simons & Whitbeck, 1991), the current study examines the temporal relationship between runaway episodes and youth homelessness in order to better understand the influence runaway episodes have on later homelessness. In particular, it was of interest whether one runaway experience and/or multiple runaway experiences predict homelessness by age 25, and whether youth who had a runaway experience at a younger age were more likely than youth who had a runaway experience at a later age to experience homelessness by age 25.

Potential Predictors of Youth Homelessness

Given that not all youth who run away from home become homeless, it is important to also explore other characteristics that may predict future homelessness (Hammer et al., 2002). Several family characteristics are commonly reported by homeless youth which may be predictive of future homelessness. Homeless youth report family environments that are unstable and high in conflict (Toro, Dworsky, & Fowler, 2007; Wolfe, Toro, & McCaskill, 1999). For example, family structures are often disrupted among homeless youth with many youth coming from single parent and/or step families (Greenblatt & Robertson, 1993; Hobcraft, J., 1998; Robertson & Toro, 1999), as well as coming from low-income and working class families (McCaskill, Toro, & Wolfe, 1998). Family socioeconomic status appears to be especially influential in the UK with some noting that the majority of homeless youth come from disadvantaged homes (Pleace et al., 2008; Quilgars et al, 2008).

Furthermore, homeless youth often report the experience of abuse or neglect prior to leaving home (Robertson & Toro, 1999; Ryan, Kilmer, Cauce, Watanabe, & Hoyt, 2000). Pleace and colleagues (2008) found that 70 percent of youth cited relationship problems with their parent/step-parent as the reason for their homelessness. The two prospective studies that examined youth homelessness found that poor quality family relationships during adolescence predicted homelessness as a young adult (18-28) (Shelton et al., 2009; Van den Bree et al., 2009). Overall, homeless youth appear to come from families that provide limited emotional, physical, or financial support, which may increase their susceptibility to homelessness.

While school involvement can provide a buffer for some children, homeless youth commonly report negative school experiences (Bousman et al., 2005; Pleace et al., 2008; Quiligar et al., 2008; Toro et al., 2007). Homeless, compared to non-homeless, youth typically report little school involvement and more school problems, such as suspension and truancy (Bousman et al., 2005; Pleace et al., 2008; Toro & Goldstein, 2000). Furthermore, homeless youth are less likely to complete high school than their non-homeless peers (Thompson et al., 2003). Van den Bree and colleagues (2009) found that school adjustment problems predicted homelessness as a young adult. Challenges with school and low educational attainment may inhibit youth's ability to become self-sufficient by limiting their employment opportunities and contributing to an increased risk of future homelessness (Robertson & Toro, 1999).

Perhaps in response to negative family and school experiences, homeless youth often associate with deviant peers and engage in socially deviant behaviors (Auesrwald et al., 2002; Gaetz, 2004; Robertson & Toro, 1999). Substance use problems are prevalent among homeless youth with an estimated 70-95% of youth reporting substance use (Booth & Zhang, 1997; Chen et al., 2006; Martijn & Sharpe, 2006) and 69-71% meeting criteria for a substance use disorder (Baer, Ginzler, & Peterson, 2003; Kipke, Montgomery, Simon, & Iverson, 1997). The relationship between substance use and homelessness is somewhat unclear. Shelton and colleagues (2009) found that drug use, but not alcohol use, as an adolescent predicted homelessness as a young adult. However, Van den Bree and colleagues (2009) found that substance use was not independently predictive of homelessness as a young adult. Therefore, research to further untangle the relationship between substance use and youth homelessness is needed.

In addition to substance use, homeless youth report involvement in other risky behaviors. Delinquent activities, such as property crimes, selling drugs, and sex work are commonly reported among samples of homeless youth (Johnson, 2006; Whitbeck, Hoyt, & Ackley, 1997). Once homeless, some youth may engage in delinquent behavior out of necessity, in order to survive on the streets (Robertson & Toro, 1999). However, less is known regarding the influence delinquent behavior may have on homelessness. Sexual risk behaviors are also common among homeless youth (Rew, Fouladi, & Yockey, 2002). In fact, rates of sexually transmitted disease (STD) and pregnancy are high, with an estimated 41 to 60% of young homeless females reporting at least one prior pregnancy (Anderson, Freese, & Pennbridge, 1994; Haley et al., 2004; Rew et al., 2002). Among African American females in particular, teen pregnancy is associated with a higher risk of adolescent and adult homelessness

(Fothergill et al., 2012). While it is well established that these risk behaviors are common among homeless youth, the dearth of longitudinal research limits our understanding of how these risk behaviors influence future homelessness.

Current Study

The current study examines individual and family characteristics assessed during adolescence (12-18 years) that predict homelessness by age 25. While several studies have documented factors associated with running away from home, only a limited number of studies have examined longitudinal predictors for those who eventually become homeless. Ecological Systems Theory (Bronfenbrenner, 1979) provides a comprehensive framework in which to understand how environmental, family and individual factors impact homelessness among youth, and was used to guide the hypotheses in this study. In particular, according to Bronfenbrenner, individuals are influenced by inter-related systems within the environment, with negative interactions in one setting influencing, and influenced by, interactions across other settings. Specifying early predictors of homelessness across these different settings is critical in order to identify those who are at highest risk for homelessness and to guide prevention efforts. The hypotheses are as follows:

Hypothesis 1

Previous findings indicate that running away from home is predictive of homelessness (Shelton et al., 2009) and that youth who report multiple runaway episodes and run away at an earlier age report even higher family and individual problems (Baker et al., 2003; Thompson & Pillai, 2006; Thrane et al., 2006). Therefore, running away from home multiple times and at a younger age was expected to predict future homelessness by age 25 to a greater extent than a single runaway episode at an older age.

Hypothesis 2

Given the relationship between family and individual risk behaviors and homelessness (Robertson & Toro, 1999; Shelton et al., 2009; Van den Bree et al., 2009), it was expected that several family and individual risk behaviors during adolescence would predict homelessness by age 25. In particular, a less stable family environment, lower educational attainment, and higher involvement in substance use, delinquent behaviors, and teenage pregnancy were expected to predict higher risk of homelessness by age 25.

Methods

This study uses data from the National Longitudinal Survey of Youth 1997 (NLSY97), which includes a nationally representative sample of 8,984 youths in the United States. The sample represents those who were born between January 1, 1980 and December 31, 1984 and were living in the U.S. during the initial survey round at 1997. Respondents have been interviewed annually since 1997 when they were between the ages of 12 and 18 years until recently, when they were in their late 20s to early 30s (Center for Human Resource Research (CHRR), 2013). The current study uses data from 1997 to 2009 when information about runaway and homeless experiences were available. The NLSY97 is well-suited for the

current research because it provides a wide range of information on life course experiences and sensitive issues, for example, delinquency and substance use. Moreover, detailed household information (e.g. family income, parenting styles, and parents' health) were gathered, which allows various facets of youths' risk behaviors and protective factors to be taken into account.

Measures

Running Away and Homeless Experiences—The same set of questions regarding the respondent's history of running away from home and staying away at least overnight was asked during the survey years of 1997-2002 in the NLSY97. The information includes the age at first runaway and the total number of runaway episodes that an individual has experienced. This information was used to create variables assessing whether the respondent ever ran away from home by age 17 and whether the respondent ran away once or repeatedly. About 18% of the entire sample (n=1,631) reported ever running away from home by age 17: 60.1% (n=980) ran away once while 39.9% (n=651) ran away two or more times. Moreover, age at the time of the first runaway episode was categorized as early age (at or before age 12), middle age (age 13-15), and late age (age 16-17). The early age runaway group was included as the reference category. Regarding homeless experiences, respondents were asked the same set of questions regarding their experience of being homeless or living in a homeless shelter (for two or more nights in a row) in survey years of 2002, 2007, 2008, and 2009. About 2.6% of the respondents (n=231) reported experiencing homelessness by age 25 in the NLSY97.

Demographics—The current study includes sex and race/ethnicity as covariates in the analysis. Sex was measured as a dichotomous variable: male or female. Race/ethnicity was measured by two indicators: African-American and Hispanics with non-Hispanic non-Black whites and others being a reference group.

Family Characteristics—Several family characteristics were included in the analysis to assess family environment, including, family poverty, family structure, family routine, parenting styles, parental health, and mother's birth as a teen. Family poverty was measured by a ratio comparing the gross household income or the gross family income to the federal poverty level for previous year, taking household size into account (The Center for Human Resources 2013). A higher poverty ratio indicates a higher family income. For example, a poverty level of 1.0 means that the family income places it just at the poverty level, a poverty ratio of 2.0 means that the family income places it at double the poverty level. Family structure was measured by several indicators: at age 14 whether a respondent lived in a stepfamily, single parent family, and other families (i.e. adopted, foster, relatives, grandparents, and others) while living with both biological parents being a reference group. Family routine was measured by the Family Routine Index (FRI) which measures youth's routine activities with the family. Items in the Family Routine Index include (Child Trends & Center for Human Resource Research 1999): in a typical week 1) how many days do you eat dinner with your family? 2) how many days does housework get done (when it is supposed to, for example cleaning up after dinner, doing dishes, or taking out the trash?) 3) how many days do you do something fun as a family such as play a game, go to a sporting event, go

swimming and so forth? and 4) how many days do you do something religious as a family such as go to church, pray or read the scriptures together? The index ranged from 0 to 28, which was transformed into three categories: low level of family routine (*FRI scores* Mean - 1SD), mid-level of family routine (Mean - 1SD < *FRI scores* Mean + 1SD), and high level of family routine (Mean + 1SD < *FRI scores*). Youth's report of the parenting styles of their residential/non-residential parents was based on two variables that assessed parental responsiveness (When you think about how s/he (mother/father) acts towards you, in general, would you say that s/he is very supportive, somewhat supportive, or not very supportive?) and parental strictness (In general, would you say that s/he (mother/father) is permissive or strict about making sure you did what you were supposed to do?). Responses were combined to produce a Parenting Style variable with four categories: uninvolved (permissive and not very, or somewhat supportive), permissive (permissive and very supportive), authoritarian (strict and not very or somewhat supportive), and authoritative (strict and very supportive) parenting styles for both mothers and fathers, respectively. In addition, parents' health status was analyzed, and included parents' general health (0=poor/fair, 1=good-excellent) and work limitation due to health (0=no limitation, 1= limitation). A categorical variable for mothers of the youth who had a teen birth was included as well (0=no, 1=yes).

Individual Characteristics: School involvement was measured by two items: whether a respondent completed high school or their GED by age 25, and whether the respondent completed college by age 25. Substance use was measured using the Substance Use Index, which was modified from the National Survey of Family and Households (NSFH). The questions include whether respondents have ever smoked a cigarette, drank alcohol, or used marijuana. The index scores range from 0 to 3 and higher scores indicate greater substance use (Child trends & Center for Human Resource Research 1999). Nine items which were originally included in the Delinquency Index in the NLSY97 were used to measure delinquency (i.e. carry a hand gun, belong to a gang, damage or destroy property, steal, commit to other crimes, attack someone, sell marijuana, and experience arrest) (CHRR, 1999). The index was transformed into 3 categories in the analysis: 1) low level of delinquency (Index Scores Mean - SD/2), 2) mid-level of delinquency (Mean - SD/2 < Index scores Mean + SD/2), and 3) high level of delinquency (Mean + SD/2 > Index scores). Teenage birth was measured by a dummy variable indicating whether a respondent had a child as a teen.

Analytic plan

The current study investigated how youth's runaway experiences predicted homelessness by age 25 using a multivariate logistic regression model. Among those who were homeless (n=231), 3 individuals had been homeless before running away, and therefore were dropped from the final analysis. An additional 23 individuals who have missing values on covariates were also dropped. Therefore, the final sample of 8,958 youths included 1,625 who ever ran away by age 17 and 228 who experienced homelessness by age 25.

The association between running away and homelessness is influenced by confounding variables that unintentionally affect the estimation of the relationship between running away

and homelessness. In other words, youth who run away from home differ from those who do not in significant ways on key variables such as substance use, delinquency, and household characteristics (Tucker et al., 2011; Tyler & Bersani 2008) that may increase the likelihood of homelessness. To adjust for the bias in estimated treatment effects (in this case, runaway), propensity score matching was used (Rosenbaum & Rubin 1983). Unbalances of key covariates in treatment and control groups are matched using the Radius matching techniques with a 0.01 caliper level. Caliper and Radius matching allows for the comparison of many units within the caliper if good matches are not available, and therefore helps to avoid the risk of bad matches (Caliendo & Kopeinig 2005). After the matching, double robust estimation is used to correctly specify the true relationships among treatment (runaway), covariates, and the outcome (homeless) (Funk, Westerich, Davidian, & Wiesen 2010; Robins, Hernan, & Brumback 2000). Double robust estimation combines matching on the propensity score with a regression model by first discarding all the data that was not matched and then using control cases multiple times via weights gained from the matching process (Funk et al. 2010). Finally, it is possible that a ‘hidden bias’ may exist and influence the robustness of the results, although potential biases in the treatment and control groups (runaway and no-runaway) are taken into account by the propensity score matching. To address how the findings are sensitive to the unobserved bias, a sensitivity analysis was conducted using the bounding approach proposed by Rosenbaum (2002). All data have been weighted using the custom set of survey weights in the NLSY97 to adjust the complicated sampling procedure (Center for Human Resource Research, 2013).

The results first describe the cumulative proportion of youth who runaway and experience homelessness, followed by a description of the sample and the means-adjusted propensity matched sample. Logistic regression models were then estimated to predict homelessness in early adulthood. Logistic regression was used rather than discrete-time event history or Cox proportional hazards models because the data for the dependent variables are not structured in a format that allows for the formation of either monthly or yearly time-varying outcomes.

Results

Table 1 describes youth's age at first runaway and homeless experiences in the NLSY97. About 20% of runaway youth left home at or before age 12, about 36% between age 13 and 15, and about 44% between age 16 and 17. Among youth who had experienced homelessness, about 11% were homeless at or before age 17, about 60% between the ages of 18 and 22, and about 29% between the ages 23 and 25.

In Table 2, individual and family characteristics of the NLSY97 included in the logistic regression model are presented by runaway experiences. The left-hand column reports the means and proportions of the characteristics before propensity score matching, and the right-hand column shows the balanced means and proportions after the matching. In Table 3, findings from a logistic regression model predicting homelessness are presented. The left column shows the coefficients from a logit model before matching, and the right column displays those after matching. Because significant differences exist in individual and household characteristics by type of runaway (i.e. one-time and multiple runaway incidents), logistic regression models predicting homelessness using propensity score matching with

one-time runaway as a treatment and repeated runaway as a treatment, were estimated separately. Odds ratios from the models are shown in Figure 1.

The left column in Table 2 describes the significant differences between runaway youth and non-runaway youth on almost every variable considered. In addition, those with repeated runaway experiences have worse outcomes on nearly every variable considered. For example, a smaller proportion of runaway youth completed either high school or college by age 25, and the proportions are smallest for those with repeated runaway experiences. Runaway youth have higher delinquency scores and a higher proportion experienced a teen birth. A higher proportion of females have ever run away, and the sex differences are larger among repeated runaways. When considering family and household characteristics, runaway youth are also disadvantaged. A larger proportion of runaway youth come from families with lower poverty ratios and also from single parent, step-parent or some other nontraditional family structure. Runaway youth also come from homes with less of a family routine, and a higher proportion have parents with worse general health, and who have work limitations due to health problems. Significant differences exist in parenting style by runaway status. A higher proportion of runaway youth have mothers and fathers with uninvolved and authoritarian parenting styles, and a smaller proportion have mothers and fathers with permissive parenting styles. Finally, a much higher proportion of runaway youth have a mother who had her first birth as a teenager.

When the means were adjusted after the propensity score matching, no significant differences were observed in any of the variables considered by runaway status. This indicates that the matching process successfully achieved balance for relevant covariates and therefore, statistical significance is no longer derived from any between-group differences in a matched model.

Table 3 presents results from the logistic regression models predicting homelessness by age 25. Data before and after propensity score matching are presented; the two models show few differences. Most importantly, having ever runaway prior to age 17 is positively and significantly associated with being homeless by age 25, and the difference between the two models is small. In addition, Table 3 finds that higher educational attainment significantly reduces the odds of homelessness in both models. Several other variables have a significant positive effect on the odds of being homeless by age 25. Living in any family structure other than a traditional two parent biological structure strongly and significantly increases the odds of homelessness, as does having a parent with work limitations due to health problems. Two variables, being Hispanic and having a parent with a permissive parenting style, reduce the odds of being homeless by age 25 in the matched model. One additional variable, having a high-level of family routine, significantly decreases the odds of homelessness before the propensity score match. However, this effect disappears after the match, which indicates that the level of family routine significantly determines runaway status but does not directly affect the odds of being homeless by age 25.

Figure 1 presents findings from a logistic regression model with all the variables included in Table 3, but the runaway variable is now presented in three categories: no runaway experience, one time runaway, and repeated runaway. Compared to those who never ran

away, running away from home before age 17 more than doubles the odds of experiencing homelessness by age 25 (OR=3.24 before PSM and 2.88 after PSM), but only for those with repeated runaway experiences. For those who run away only once before age 17, there is no statistically significant difference in the risk of being homeless by age 25, compared to youth who never run away before age 17 after the propensity score match.

Sensitivity Analysis

To determine how strong the findings are against a hidden bias, an analysis was done to simulate different levels of unmeasured biases and test whether the biases significantly influence the likelihood of running away and being homeless. The Mantel and Haenszel (MH, 1959) statistics was used to test the sensitivity by simulating bias levels ranged from 1 to 2. The bias level 1 indicates the 'base' scenario of no hidden bias (Caliendo & Kopeinig 2005; Rosenbaum 2002). The increasing number assumes that the odds of running away from home would be higher for the treatment group (runaway group) than the control group (no-runaway group), even after youths are evenly distributed across observed characteristics. For example, if the bias level 2 (which is expressed as $e^{\gamma} = 2$) is significant, it indicates that those in the treatment group are 2 times more likely to run away from home despite the matching process, due to unobserved biases.

In the current sample, the significance level of the MH statistics for $e^{\gamma}=1$, 1.5, and 2 was found to be 0.000, 5.2e-08, and 0.001, respectively. These results show that the estimated treatment effects (i.e. the effect of running away on homelessness) are still robust even though we allow a hidden unmeasured bias which increases the likelihood of running away from home. Therefore, we conclude that youth's runaway experiences by age 17 are a significant determinant of whether the youth become homeless by age 25¹.

Discussion

Using the National Longitudinal Survey of Youth (NLSY), a large, nationally representative dataset, this study examined predictors of homelessness at age 25 among individuals first assessed between the ages of 12 to 18 years. Prospective analyses of homelessness are rare, and this study provides unique insight into individual and family-based predictors of homelessness.

Researchers have long suggested a link between running away from home and homelessness (Simons & Whitbeck, 1991). However, to date, limited empirical studies have prospectively examined this relationship. In the current study, a large proportion of adolescents reported having run away from home (18%), indicating that running away from home is not a rare event. Homelessness is more rare, with only 2.6% of the respondents reporting a homeless experience by age 25. These findings are consonant with the conclusion that emerging adults are more likely to experience homelessness than older adults given that the National Coalition on Homelessness (2009) estimates that 1% of the population experiences homelessness any given year.

¹The results were robust in models with one-time and repeated runaways.

Of interest is that multiple runaway episodes prior to the age of 18 predicted homelessness in emerging adulthood, but not the report of a single runaway episode. A pattern of repeat runaway episodes likely reflects more negative individual and family interactions across domains, supporting Ecological Systems Theory (Bronfenbrenner, 1979). That is, a single risk event such as running away becomes critical only when it represents a pattern of risk, accumulating over time across multiple systems. Future research might indicate that for some families, a runaway episode results in corrective efforts within the family system, as the majority of adolescents ran away from home only one time (60.1%), and a single runaway experience likely does not result in long-term harmful effects.

Consistent with previous prospective studies, educational attainment was predictive of homelessness. Both van den Bree and colleagues (2009) and Shelton and colleagues (2009) found that low school performance predicted homelessness among young adults. While the current study does not assess the mechanism through which school performance impacts later homelessness, it is likely that poor school performance limits an individual's employment opportunities and contributes to financial hardship. Given the consistent link between school problems and later homelessness, screening of low performing and disengaged students for correlated risks such as running away and homelessness could result in targeted prevention services.

Other predictors of homelessness were identified. In particular, a non-traditional family structure predicted homelessness. Among runaway adolescents, conflict with a step-parent is often cited as reason youth leave home (Toro et al., 2007). In fact, non-traditional family structures have consistently predicted runaway experiences in previous studies (Sanchez, Martin, & Greene, 2006), as well as a range of other negative developmental outcomes including poor educational, well-being, and behavioral outcomes (Cherlin, 1994; Hetherington & Stanley-Hagan, 1999). The current study also found that a parent with work limitations due to health problems predicted homelessness. These families might experience higher levels of family stress, with previous studies finding that health-related work limitations are associated with a higher risk of divorce (Teachman, 2010). While non-traditional family structure and parental health-related work limitations were associated with negative outcomes, it is likely that other factors associated with those situations may be at least partially responsible for the negative outcomes. For example, it may be that these family situations contribute to increased family stress and conflict, which may then contribute to an increased risk of youth homelessness (van den Bree et al., 2009). However, the current study did not measure family stress. An important question for future research is whether controlling family stress results in a non-significant relationship between family structure, parental work status and running away and homelessness. Such a finding would suggest that family stress is the primary determinant of homelessness rather than family structure or parental work status.

Being Hispanic and having a permissive father or mother reduced the odds of homelessness. Similarly, Shelton and colleagues (2009) found that Hispanic youth were less likely than youth of other ethnicities to experience homelessness by age 28. Many recognize strong family ties, known as familism, among Hispanic families (Bean & Tienda, 1987; Hartnett & Parrado, 2012). Strong family bonds, including cohesion and support are known to be

protective factors among vulnerable youth (Kington & Sullivan, 2001). This study's finding of permissive parenting, as a protective factor, is more perplexing. Possibly, the high levels of warmth associated with permissive mothering and fathering (Baumrind, 1967) buffer against an authoritarian or uninvolved parenting style. Given that permissive parenting is associated with low parental demands and high acceptance (Baumrind, 1967), youth may feel less compelled to leave home. Additionally, it is important to note that our findings did not assess any outcomes beyond whether a youth experienced homeless, consequently there may be other negative outcomes associated with permissive parenting that were not captured in the current study. Given that permissive parenting is typically considered a parenting style associated with risk rather than protection (Querido, Warner, & Eyber, 2002; Thompson, Hollis, & Richards, 2003; Williams et al., 2009), the findings highlight the need to examine family interaction styles within distressed families. Parenting models used to understand family interaction are typically developed within normal, non-distressed samples and may therefore not generalize to more distressed families.

Limitations

Some limitations should be noted. While the use of secondary datasets, such as the NLSY97, provides the benefit of a large, representative sample, it limits the measures that can be used. In the current study, questions on running away and homelessness were limited to those included in the NLSY97 study. Thus, important information about access to runaway shelters, where adolescents stayed when they ran away, how long they stayed away from home, and length of time homeless were not obtained. While the NLSY97 included several measures of family characteristics that provided insight into the family environment, measures of family abuse, conflict, and stress were not available. Further, the measure of substance use was limited to occurrence and did not capture frequency. The NLSY97 did not include a measure of sexual orientation, however, sexual minority youth are sometimes over-represented in homeless and runaway populations (Robertson & Toro, 1999), and thus sexual orientation is an important factor that was not included in the current study.

Moreover, survey attrition may have been related to experiences of running away and homelessness. There is some indication that those with less than a high school degree, whose family has a low level of routine, and whose fathers have uninvolved and permissive parenting styles are more likely to drop-out from the study. As a result, findings reported here may underestimate the relationship between running away and homeless experiences.

Finally, it is possible that a national survey, such as the NLSY97, may fail to capture all segments of the homeless youth population. That is, youth with more severe problems, or those living on the streets for long periods of time, may not have been tracked and included in the current survey. However, no nationally representative sample of youth and young adults that could capture these more vulnerable youth is currently available.

Conclusions

Despite these limitations, this is a large, prospective, population-based study with clear research and prevention implications. Most studies of homeless youth utilize convenience samples, while this study offers valuable insight regarding the early life histories of

homeless young adults. In addition, this study used rigorous statistical methods, including propensity score matching which accounts for sampling effects in the analyses, allowing greater confidence in the robustness of the findings. A unique finding in the current study was that multiple episodes of running away during adolescence was highly predictive of homelessness in young adulthood, and a single runaway episode was not predictive.

Large, longitudinal, population-based studies such as this have the unique ability to offer insights into those most at risk for low probability events such as homelessness. This study identified a set of correlated risk and protective factors observed during adolescence that predicted homelessness in emerging adulthood. These risk and protective factors crossed multiple systems in the child's life including individual, family and social contexts. Unlike medicine where genetic links to disease such as cancer are sought, social scientists must contend with the many individual and environmental factors that together create the highest probability of risk (Bogenschneider, K. 1996; Small & Memmo, 2004). Once those at most risk are identified, then effective prevention strategies are essential. No homeless prevention interventions were identified in the literature. However, family therapy has been shown to be effective for use with runaways (Slesnick & Prestopnik, 2005; Slesnick, Erdem, Bartle-Haring, & Brigham, 2013), and could potentially be added onto school-based programming for those identified as most at risk for future homelessness (e.g., more than one runaway episode, having a non-traditional family structure, high parental work stress, etc.).

In addition to providing guidance for future preventive efforts, the current study also serves as a starting point for future research initiatives. This study identified several risk factors for experiencing homelessness as a young adult, thus making it possible to identify groups that may be at risk. However, recent research efforts have also highlighted the importance of pinpointing the occurrence of trigger events (e.g., an argument with parent, running away from home) that serve as a catalyst to a youth's transition into homelessness (Pleace et al., 2008; Quilgars et al., 2008). Future research may benefit from examining how the accumulation of on-going risk factors may create an environment in which the occurrence of one critical event may trigger the youth's transition into homelessness. Additional research is needed to better understand how the risk factors identified in this study combined with the occurrence of trigger events can create pathways into homelessness. Understanding the mechanism through which risk factors impact youth can provide valuable knowledge towards preventive efforts.

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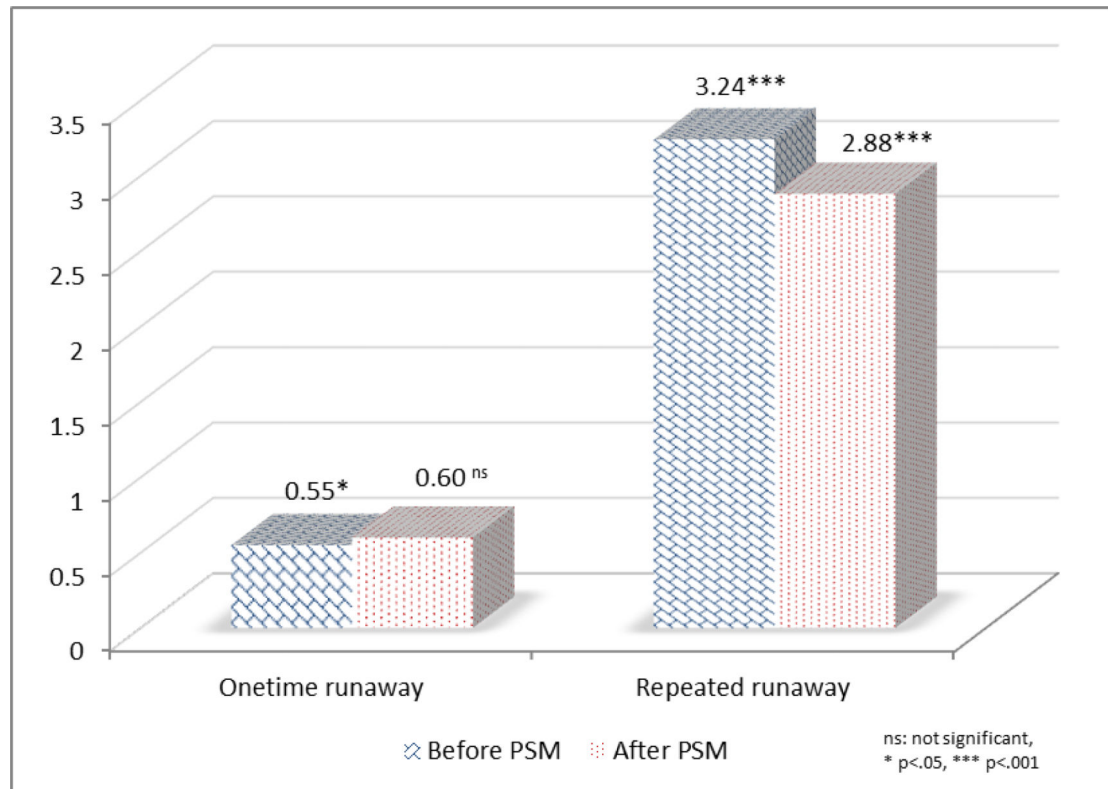


Figure 1.
Odds ratios for the relationship between runaway and homeless experiences

Table 1

Distribution of age at first runaway and homelessness in the NLSY97

	Frequency	Percent (%)
Age at first runaway	1,625	100.00
Early first runaway (at or before age 12)	327	20.12
Mid age first runaway (age 13-15)	579	35.63
Late age at first runaway (age 16-17)	719	44.25
Age at first homelessness	228	100.00
Early first homeless (at or before age 17)	26	11.40
Mid age first homeless (age 18-22)	136	59.65
Late age at first homeless (age 23-25)	66	28.95

Note: Not weighted.

Table 2
Achieving balance among run-away and no-runaway youths using Caliper and Radius Matching (n=8,958)

	Means before propensity adjustment				Means after propensity adjustment			
	No runaway (n=7333)	One-time (n=977)	Repeated (n=648)	Any Runaway (n=1625)	No runaway (n=7333)	Any Runaway (n=1625)	t-value	p> t
Female	0.48	0.52	0.56	0.54	0.51	0.53	1.29	0.20
Race/ethnicity (ref: non-Hispanic non-Black whites and others)								
Black	0.15	0.17	0.15	0.16	0.28	0.26	-0.84	0.40
Hispanic	0.13	0.11	0.15	0.13	0.21	0.21	-0.11	0.91
Education (ref: less than a high school degree)								
Completing high school or equivalent by age25	0.89	0.80	0.71	0.76	0.74	0.74	0.51	0.61
Completing college by age25	0.30	0.13	0.09	0.11	0.10	0.10	0.02	0.99
Substance use (0-3)	0.93	1.55	1.98	1.71	1.61	1.63	0.45	0.65
Delinquency (ref: low level of delinquency)								
Mid level of delinquency	0.34	0.36	0.32	0.34	0.34	0.35	0.33	0.74
High level of delinquency	0.13	0.36	0.52	0.42	0.41	0.40	-0.15	0.88
Teen birth	0.05	0.12	0.16	0.14	0.16	0.16	-0.44	0.66
<i>Household characteristics</i>								
Family SES (ref: family poverty level less than 50%)								
51-100%	0.06	0.10	0.10	0.10	0.12	0.12	-0.22	0.83
101-150%	0.06	0.09	0.11	0.10	0.10	0.10	-0.07	0.94
151-200%	0.08	0.08	0.10	0.09	0.09	0.09	-0.48	0.63
More than 200%	0.49	0.44	0.39	0.42	0.34	0.36	1.31	0.19
Family Structure (ref: living with both biological parents)								
Stepfamily	0.14	0.16	0.20	0.18	0.16	0.16	0.62	0.54

	Means before propensity adjustment				Means after propensity adjustment			
	No runaway (n=7333)	One-time (n=977)	Repeated (n=648)	Any Runaway (n=1625)	No runaway (n=7333)	Any Runaway (n=1625)	t-value	p> t
Single parent family	0.25	0.36	0.39	0.37	0.41	0.40	-0.79	0.43
Other family (adopted, foster, relatives, grandparents, and others)	0.05	0.06	0.08	0.07	0.07	0.08	-0.03	0.98
Family routine (ref: low level of family routine)								
Mid level of family routine	0.41	0.43	0.32	0.39	0.41	0.38	-1.42	0.16
High level of family routine	0.09	0.06	0.06	0.06	0.06	0.07	-0.01	0.99
Parenting styles								
Mother (reference: authoritative)								
_ uninvolved	0.09	0.16	0.23	0.19	0.18	0.18	0.12	0.90
_ permissive	0.36	0.34	0.31	0.33	0.32	0.32	-0.08	0.94
_ authoritarian	0.11	0.16	0.19	0.17	0.18	0.18	-0.47	0.64
Father (reference: authoritative)								
_ uninvolved	0.12	0.18	0.19	0.18	0.16	0.18	1.05	0.30
_ permissive	0.26	0.20	0.15	0.18	0.17	0.17	0.08	0.93
_ authoritarian	0.16	0.23	0.30	0.25	0.24	0.24	-0.01	0.92
Parents' general health (0=fair/poor, 1=good-excellent)	0.79	0.75	0.75	0.75	0.71	0.73	1.17	0.24
Parent's work limitation because of health (0=no, 1=yes)	0.13	0.17	0.18	0.17	0.19	0.18	-0.81	0.42
Mother was teenage mom. (0=no, 1=yes)	0.10	0.15	0.17	0.16	0.18	0.17	-0.25	0.80

*
p .05**
p .01***
p .001

Table 3

Logistic regression models predicting Homeless by age25, before and after propensity score matching

	Before match		After match	
Runaway before age17	.78 (.27)	**	.74 (.26)	**
Age at first runaway (ref: early first runaway)				
Mid age first runaway (age 13-15)	-.58 (.32)		-.46 (.30)	
Late age first runaway (age 16-17)	-.31 (.31)		-.13 (.29)	
<i>Individual characteristics</i>				
Female	-.05 (.17)		.11 (.20)	
Race/ethnicity (reference: white)				
Black	-.10 (.18)		-.28 (.21)	
Hispanic	-.51 (.22)	*	-.47 (.24)	*
Education (reference: less than high school)				
Completing high school or equivalent by age25	-.27 (.18)		-.30 (.20)	
Completing college by age25	-1.37 (.36)	***	-1.86 (.65)	**
Substance use (0-3)	.21 (.09)	*	.22 (.09)	*
Delinquency (reference: low level of delinquency)				
Mid level of delinquency	.38 (.21)		.35 (.25)	
High level of delinquency	.49 (.26)		.44 (.28)	
Teen birth	.18 (.23)		.06 (.23)	
<i>Household characteristics</i>				
Family SES (reference: family poverty level less than 50%)				
51-100%	.09 (.25)		.22 (.25)	
101-150%	-.27 (.30)		-.16 (.31)	
151-200%	-.21 (.31)		-.14 (.41)	
More than 200%	-.09 (.20)		-.12 (.25)	
Family Structure (reference: living with both biological parents)				
Stepfamily	.90 (.22)	***	1.16 (.27)	***
Single parent family	.81 (.20)	***	.72 (.25)	**
Other family (adopted, foster, relatives, grandparents, and others)	1.08 (.29)	***	1.15 (.35)	***
Family routine (reference: low level of family routine)				
Mid level of family routine	.28 (.16)		.15 (.19)	
High level of family routine	-.78 (.39)	*	-.57 (.44)	
Parenting styles				
Mother (reference: authoritative)				
_ uninvolved	-.08 (.22)		-.18 (.23)	
_ permissive	-.29 (.18)		-.48 (.22)	*
_ authoritarian	.26 (.20)		.00 (.22)	
Father (reference: authoritative)				

	Before match	After match
_ uninvolved	.10 (.21)	-.16 (.24)
_ permissive	-.34 (.23)	-.78 (.30) *
_ authoritarian	-.04 (.20)	-.25 (.23)
Parents' general health (0=fair/poor, 1=good-excellent)	-.05 (.20)	-.04 (.22)
Parent's work limitation because of health (0=no, 1=yes)	.63 (.20) ***	.61 (.22) **
Mother was teenage mom. (0=no, 1=yes)	.02 (.21)	-.20 (.23)

Note: Numbers in parentheses are standard errors. All analyses are weighted using the customer weights in the NLSY97.

*
p .05

**
p .01

p .001