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The Effect of Childhood Supervisory Neglect on Emerging Adults' Drinking

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Abstract

This study investigated the effect of childhood supervisory neglect on emerging adults' drinking. Child supervisory neglect is the most common form of child maltreatment in the United States, but few studies explore supervisory neglect separate from other forms of maltreatment among emerging adults, 18–25 years old. The study sample included (n = 11,117) emerging adults, 18–25 years old who participated in Waves I and III of the National Longitudinal Study of Adolescent Health (Add Health). We conducted separate analyses for male and female emerging adults, because they have different rates of alcohol consumption and alcohol risk behaviors. Our study used latent class analysis to understand how patterns of alcohol risk behaviors clustered together. For males, we found the following four classes: (1) multiple-risk drinkers, (2) moderate-risk drinkers, (3) binge-drinkers, and (4) low-risk drinkers or abstainers. For females, we found the following three classes: (1) multiple-risk drinkers, (2) moderate-risk drinkers, and (3) low-risk drinkers or abstainers. For both males and females, supervisory neglect increased the odds of membership in the multiple-risk drinkers' class compared to the low-risk drinkers or abstainers' class. Single males who did not live with their parents, and who were white had increased odds of being in the multiple-risk drinkers. For females, being more educated, or in a serious romantic relationship increased the odds of membership in the multiple-risk drinkers' class. Practitioners should ask about histories of supervisory neglect among emerging adults who engage in alcohol risk behaviors.

Keywords

Child supervisory neglect; alcohol; latent class analysis; emerging adults; National Longitudinal Study of Adolescent Health; gender differences; depression; parental drinking; Add Health

Introduction

Child supervisory neglect is a significant and under-studied problem that may contribute to distinct patterns of alcohol risk behaviors among emerging adults (18–25 years old). The

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Declaration of interest

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absence of literature focusing on the long-term effects of supervisory neglect is surprising because supervisory neglect occurs more often than any other type of child maltreatment (Coohey, 2003; Mennen, Kim, Sang, & Trickett, 2010). The American Professional Society on the Abuse of Children (APSAC, 2008) defines supervisory neglect as adult supervision of a child that is inadequate to meet the child's needs. Supervisory neglect consists of discrete events that can have immediate and sometimes catastrophic consequences. Although APSAC (2008) recommends classifying supervisory neglect as distinct from other forms of neglect, few studies have done so. This gap in the literature is significant because failing to examine supervisory neglect separately obscures its specific effects, making it difficult to effectively target interventions (Merritt & Klein, 2015). While research has linked child neglect generally with later heavy drinking (Shin, Edwards, & Heeren, 2009) and alcohol dependence (Mullings, Hartley, & Marquart, 2004), it is unclear how much of this effect can be attributed to supervisory neglect, and whether emerging adults who are most likely to engage in alcohol risk behaviors are more likely to report having experienced child supervisory neglect. This paper will begin to fill this gap in the literature.

A significant portion of alcohol-related public health costs are attributable to alcohol risk behaviors among emerging adults. Alcohol risk behaviors include binge drinking, experiencing hang-overs, throwing up after drinking, driving drunk, relationship problems with friends and dating, physical fights, problems at work or school, and sexual situations that an individual regrets (Khan, Cleland, Scheidell, & Berger, 2014; Kopak, Chia-Chen Chen, Haas, & Gillmore, 2012). Binge drinking has been linked to the following adverse health and social outcomes: violence, suicide, sexually transmitted infections, unintended pregnancies, hypertension, and unintentional injuries, such as motor vehicle crashes (Kanny, Liu, Brewer, & Lu, 2013). Bouchery, Harwood, Sacks, Simon, and Brewer (2011) estimate that in 2006 binge drinking yielded an economic cost of $223.5 billion in the United States. Compared to all other age groups, emerging adults have the highest rates of alcohol use (59.6%) and binge drinking (i.e., drinking five or more drinks on a single occasion; 37.9%). Male emerging adults have higher rates of alcohol use (62.3% vs. 56.9%) and binge drinking (44.4% vs. 31.4%) than female emerging adults (SAMHSA, 2014). In light of these notable differences, this paper examines the effect of supervisory neglect on alcohol risk behaviors separately for males and females. We will first present our theoretical framework. Then, we will provide justification for the analytic approach our study uses. This section will conclude by detailing the current study.

Social Development Model

This study applies the Social Development Model, which blends key elements of social learning, social control, and differential association theories to explain how risk and protective factors impact alcohol risk behaviors. Within the Social Development Model, the relationships surrounding an individual, such as family members, or romantic partners, may affect alcohol use consumption and alcohol related risk behaviors (Catalano & Hawkins, 1996; Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996). On the one hand, individuals who are bonded to prosocial influences (e.g., parents or partners who do not drink heavily or engage in alcohol related risk behaviors) also tend to consume less alcohol and are less likely to engage in alcohol related risk behaviors (Catalano et al., 1996; Fleming

et al., 2008; Snyder, Gwaltney, & Landeck, 2015). Conversely, emerging adults with parents or partners who have histories of heavy alcohol consumption are at greater risk of heavy alcohol consumption themselves (White & Jackson, 2004).

Supervisory neglect

According to the Social Development Model, children's early life experiences of parental family management can reinforce later behavioral decisions. In particular, when parents closely supervise their children, children are more likely to perceive reinforcement for prosocial behaviors, including lower alcohol consumption and fewer alcohol risk behaviors (Catalano & Hawkins, 1996; Williams et al., 2007). Thus, the inverse would also be true; children who have experienced supervisory neglect may be at greater risk of higher alcohol consumption and more alcohol risk behaviors. Widom and colleagues have written extensively on the relationship between experiencing either child abuse or neglect and later alcohol use (cf. Horwitz, Widom, McLaughlin, & White, 2001; Widom & Hiller-Sturmhofel, 2001; Widom, Ireland, & Glynn, 1995; Widom, White, Czaja, & Marmorstein, 2007), but their work does not elucidate the specific effects of neglect, and it lacks a discussion of supervisory neglect. While some other studies have explored the relationship between neglect and alcohol risk behaviors, researchers have yet to focus on child supervisory neglect.

We found two studies of adults that investigated the relationship between alcohol use and earlier experiences of general neglect. In the first, Patock-Peckham and Morgan-Lopez (2010) conducted a two-group SEM path model with data from 404 university students. This study found that parent neglectfulness among the parent of the same-gender was associated with alcohol-related problems (e.g., used alcohol "to lose social and emotional inhibitions"; males 0.209, $p < 0.001$; females 0.152, $p < 0.05$). In the second, Mullings et al. (2004) interviewed female prisoners in Texas to explore the relationship between child maltreatment and alcohol dependency. They found that the women who were alcohol dependent were more likely to have retrospectively reported neglect compared to women who were not alcohol dependent. While each study has enhanced our understanding of the relationship between general child neglect and alcohol use, each also has some significant limitations. Neither study included questions about the frequency of neglect experiences, nor did either specify an age by which the experiences took place. Furthermore, these studies do not contribute to our understanding of supervisory neglect's unique contribution to alcohol risk behaviors.

Protective relationships

Relationships can function not only as risk factors, but can also protect against risky behaviors. In particular, studies have found that emerging adults who do not live with their parents are at greater risk of heavy episodic drinking than emerging adults who live with their parents (Gfroerer, Greenblatt, & Wright, 1997; White et al., 2006). Remaining at home may signify a close emotional bond between parent and child, and it may provide parents opportunities to monitor the behaviors of their emerging adult children. Relationships with romantic partners may affect alcohol use in a similar way. When emerging adults are involved in serious romantic relationships (i.e., cohabitation or marriage) their risk of heavy

alcohol consumption and/or engaging in alcohol-related risk behaviors is lower than their single counterparts (Fleming, White, & Catalano, 2010; Snyder & Merritt, 2015; Snyder & Rubenstein,2014).

Individual characteristics

In addition to accounting for the relationships surrounding an individual, the Social Development Model also considers the role individual characteristics play in either promoting or deterring heavy alcohol consumption or alcohol risk behaviors (Catalano & Hawkins, 1996). Each relevant individual characteristic is discussed below.

Gender

Gender constitutes one of the most robust correlates of alcohol consumption and alcohol risk behaviors. Specifically, emerging adult males tend to consume more alcohol than females (Chartier, Hesselbrock, & Hesselbrock, 2011; Delucchi, Matzger, & Weisner, 2008; SAMHSA, 2013). Gender differences are important to examine because males and females experience different psychological, social, and physical or physiological effects of alcohol consumption (Wilsnack & Wilsnack, 2013). One explanation of physiological differences comes from the National Institute on Alcohol Abuse and Alcoholism (NIAAA,2013), which explains that women typically weigh less and have less water in their bodies compared to men, so women tend to have higher blood alcohol concentrations after drinking the same amount of alcohol as men. For this reason NIAAA has defined binge drinking for women as four drinks and binge drinking for men as five drinks (NIAAA, n.d.). Regarding risk behaviors, research has found that males are more likely to engage in risk behaviors, such as binge drinking and drunk driving (Wilsnack & Wilsnack, 2013).

Age, ethnicity or race, and education

Age, ethnicity or race, and education are also important correlates to take into account (Merritt, 2009). The Social Development Model takes into account the role development plays in contributing to alcohol risk behaviors. Alcohol use and related risk behaviors are more prevalent during emerging adulthood (SAMHSA, 2014), but then decreases dramatically (Arnett, 2005). An additional factor is race. Emerging adults who are White or Hispanic are at greater risk of alcohol risk behaviors (Chen, Yi, Williams, & Faden, 2009). Regarding education, emerging adults in college engage in more binge drinking and drunk driving than emerging adults who are not attending college (Hingson & White, 2010).

Emotional and behavioral factors

The Social Development Model also accounts for emotional and behavioral factors that have been associated with alcohol consumption. Several studies have linked depression (cf. Dixit & Crum, 2000; Lee, Kosterman, McCarty, Hill, & Hawkins, 2012; Weitzman, 2004) and adolescent delinquency (cf. Guo, Hawkins, Hill, & Abbott, 2001; Hunter, Miles, Pedersen, Ewing, & D'Amico, 2014; Williams et al., 2007) to alcohol use during emerging adulthood. The effects of delinquency and depression may differ by gender because males are more likely to have engaged in adolescent delinquency (Connell, Cook, Aklin, Vanderploeg, & Brex, 2011; Farrington et al., 2010; Schwartz et al., 2010) and females experience higher

rates of depression (Blanco et al., 2010; Kessler et al., 2003; Lee et al., 2012). Lee et al. (2012) used data from the Seattle Social Development Project (SSDP) to investigate gender differences in how major depressive disorder prevalence fluctuates by patterns of alcohol use disorder symptoms over time. Lee et al. found that the females with the highest depression symptoms were in the group with the most severe alcohol risk behaviors, which they termed the "chronic alcohol disorder symptom subgroup." However, males had fairly consistent rates of depression between the more moderate group, which they termed the "decreaser alcohol disorder symptom subgroup" and the "chronic alcohol disorder symptom subgroup."

Latent class analysis studies

A significant body of literature has indicated that a single measure of alcohol use is inadequate to capture the heterogeneity of alcohol-related behaviors among emerging adults. While some individuals consume little to no alcohol, others binge drink and engage in a range of alcohol risk behaviors. To address these differences in alcohol use studies have applied latent class analysis (LCA) (cf. Beseler, Taylor, Kraemer, & Leeman, 2012; Cleveland, Mallett, White, Turrisi, & Favero, 2013). Much of the LCA alcohol literature regarding emerging adults has focused on the frequency and quantity of use, with fewer studies exploring alcohol risk behaviors. Below, we discuss two studies that focus exclusively on emerging adult drinking and risk behaviors. Cleveland et al. (2013) used data from 264 emerging adults who were not attending college to explore patterns of drinking behaviors. This study found the following four classes: (1) daily drinkers (5%), (2) weekend risky drinkers (23%), (3) weekend light drinkers (38%), and (4) current nondrinkers (34%). Using these classes Cleveland et al. then examined the probability of risk behaviors such as having hangovers, being sick, getting into fights, regretting sex, missing work, and driving drunk. Daily drinkers were most likely to get into fights, drive drunk and miss work, while weekend risky drinkers were most likely to get sick and regret sex. Beseler et al. (2012) examined DSM-IV alcohol use criteria and binge drinking among undergraduate students. This study found that a 3-class solution had the best fit. (1) Class 1 members (60.11%, n = 217) mainly endorsed tolerance (18.4%); none were alcohol dependent. (2) Class 2 members (31.58%, n = 114) mainly endorsed tolerance (81.6%) and drinking more than intended (74.6%); 34.2% met criteria for dependence. (3) Class 3 members (8.31%, n = 30) endorsed all dependence criteria (30%–100%); all met criteria for dependence. We were not able to find studies that have formed classes of alcohol risk behaviors among emerging adults.

The current study

This study employs the following research questions: Do male and female emerging adults have distinct patterns of alcohol use? Do child supervisory neglect, depression, and parental drinking correlate with different latent classes of alcohol use during emerging adulthood? Are being in a serious committed relationship and living with parents protective factors against problematic alcohol use? By focusing on gender differences among emerging adults, using a national dataset, and studying covariates that have not previously been studied together our study will begin to fill gaps in the literature. Our study includes the following three hypotheses:

Hypothesis 1. Both male and female emerging adults will form at least three distinct classes of alcohol-use, including a group with low alcohol use or abstinence and at least one group of alcohol users and who engage in several risk behaviors associated with alcohol use.

Hypothesis 2. The following risk factors will increase the likelihood of alcohol risk behaviors among both male and female emerging adults: retrospectively reported child supervisory neglect (Wave III), depression (Wave III), adolescent delinquency (Wave 1), parent-reported parental drinking (Wave I), and being single (Wave III).

Hypothesis 3. Living with a parent or parents and being Black are protective factors that will reduce the likelihood of heavy alcohol consumption and related problems.

Method

Study design

We used data from Waves I and III of the Add Health dataset. The Add Health website provides a more comprehensive discussion of the Add Health study design (Harris et al., 2009). Add Health data collection began in 1994 when 90,118 youth completed in-school surveys. After stratifying the school sample by gender and grade, an in-home sample was drawn from the school sample. Wave I in-home interviews were conducted between 1994 and 1995, with 20,745 youth in grades 7 through 12 (11–21 years). Wave II interviews were completed between April and August 1996, with 14,738 youth (12–21 years old) from Wave I completed in-home interviews (Wave II). Between August 2001 and April 2002, 15,197 young adults 18–28 years old completed in-home interviews for Wave III. The institutional review board at the University of North Carolina at Chapel Hill approved all of the original Add Health study protocols and consent was obtained from all study participants.

Weighted design

All of our analyses included Wave III sampling weights and survey analysis techniques to adjust for the unequal probability of selection, clustered sampling design, and participant attrition from prior waves. The selection probability was unequal because of nonresponse, poor frame coverage, and randomization in the sample selection. Additional information regarding the sampling design Add Health is available from Chantala and Tabor (2010) or http://www.cpc.unc.edu.libproxy.lib.unc.edu/projects/addhealth/.

Study sample

Of the 15,197 cases available at Wave III, 991 cases were lost because our analyses required the inclusion of cases with weights, stratification and cluster variables (Chantala, 2006). We also omitted the 125 cases that were not 18–25 years old. In addition, we left out 2,957 cases due to missing covariate information and seven cases due to nonresponse on questions regarding alcohol consumption or related risk behaviors. Mplus employs listwise deletion for missing covariates. As a result our analytic sample included 11,117 emerging adult participants from Wave III of Add Health. Only participants with complete data were used in the present study.

Measures

Alcohol use—During Wave III, eight dichotomous (Yes = 1) items were used to assess emerging adults' alcohol use and risk behaviors. Unless otherwise specified the items refer to experiences over the past 12 months. To account for the physiological differences in how males and females physically process alcohol, male emerging adults were asked whether they had d*rank 5 or more drinks during the past 2 weeks*, while female emerging adults were whether they had d*rank 4 or more drinks during the past 2 weeks*. To assess for other alcohol risk behaviors which occurred over the past 12 months we used five items from Add Health's "Alcohol-related problems scale" (Harris et al.,2009): (1) "You had problems at school or with school work because you had been drinking," (2) "Did you get into a sexual situation that you later regretted because you had been drinking," (3) "You got into trouble with your parents because you had been drinking," (4) "You were hung over," and (5) "Did you get into a physical fight because you had been drinking." These items serve as a proxy for alcohol abuse as defined in the DSM-IV (American Psychiatric Association, 1994). We did not include the following two items from the original scale because they were highly correlated with other items: "You had problems with your friends because you had been drinking," and "You were sick to your stomach or threw up after drinking." The last two items we included asked if they had (1) been *drunk at school or work;* or (2) "*driven drunk* during the past 7 years."

Demographics—The following demographic characteristics were captured during Wave 1: gender, race, Hispanic origin, and date of birth. For our analyses we coded male gender as 1. In the Add Health dataset Hispanic is considered an ethnicity and is handled separately from race. A dichotomous question asked, "Are you of Hispanic or Latino origin?" which we coded "yes" as 1 with the referent (0) being those who reported not being Hispanic. We used the following categories for race: Black, White, Asian/Pacific Islander, and other. Because we expected that alcohol consumption would be highest among whites we coded white as 1. Thus, the three other categories for race (i.e., blacks, Asian/Pacific Islander, and other) served as the referent (were equal to zero). We calculated respondents' ages at Wave III using the dates of birth provided by respondents at Wave I. Lastly, during Wave III respondents provided their highest level of education, which ranged from not completing high school to beyond college. For our analyses we standardized education and ages ($M = 0$; $SD = 1$).

Risk and protective factors

Child supervisory neglect—During Wave III respondents were asked to retrospectively answer a question regarding experiences prior to the 6th grade: "How often had your parents or other adult care-givers left you home alone when an adult should have been with you?" The items were originally scaled so that 1 = 1 time, 2 = 2 times, 3 = 3–5 times, 4 = 6–10 times, and 5 = more than 10 times. Following the approach used by Currie and Tekin (2006), we dichotomized supervisory neglect to include instances when individuals experienced at least 10 experiences of supervisory neglect.

Depression—The 10-item modified version of the Center for Epidemiologic Studies–Depression (CES-D) scale was used to determine whether participants were depressed. The

internal consistency of the scale was 0.80. For our analyses, we standardized the summed scores for this measure ($M = 0$; $SD = 1$).

Parental drinking—During Wave I, the parent survey asked parents whether they had consumed 5 or more alcoholic drinks on one occasion in the past month (1 = yes). The inclusion of heavy parental drinking as a covariate controls for both genetic and social influences of a parent who drinks heavily (Wilson & Widom, 2010). The vast majority of parents surveyed were biological mothers (86.6%). The next largest groups were biological fathers (4.1%), adoptive mothers (2.8%), and grandmothers (1.8%). In addition to these relationships, other "parents" who completed the survey (4.7%) included adoptive fathers, step-mothers, step-fathers, other relatives, and foster care providers.

Live with parents—When respondents specified that they resided with their parents during Wave III we coded the response (yes = 1).

Relationship status—At Wave III, respondents who answered that they had been married at least one time and answered yes to the question, "Are you still married?" were considered to be married. Respondents were cohabitating if they answered that they had ever lived in a "*marriage-like relationship*" *for at least one month* and if they were "*still living together*." Respondents who were not married or cohabitating were designated as single. Because prior studies have found that being in a serious romantic relationship reduces substance use, single functioned as the referent (Fleming et al., 2010; Snyder & Rubenstein, 2014).

Statistical analysis—Descriptive statistics were calculated using Stata 13.1 and LCA were conducted in Mplus 7.11. We took into account data stratification, clustering, and sampling weights for all of these analyses. To compute the F-statistic, degrees of freedom and *p* value for the comparisons across gender for categorical variables, we used the svy: tab command; and for continuous variables, we used the svy: mean command followed by the test command.

Scholars use LCA to investigate patterns of alcohol use during one point in time. By carefully combing through a dataset, LCA locates and groups together individuals with similar patterns of survey question responses. The resulting groups that are found are referred to as classes. Because individual persons' similarities are used to form the classes, LCA is referred to as person-centered (Barnes, Boutwell, Morris, & Armstrong, 2012; Snyder & Merritt,2015). We fit the eight alcohol use items with a one-class model, and increased classes until we had evaluated seven models. The model fit statistics used to assess the models were log likelihood, Bayesian Information Criteria (BIC),and Aikaike Information Criteria (AIC). The lowest possible values are preferred for the log likelihood, BIC, and AIC statistics. McCutcheon (2002) explains that while models with more parameters technically "fit" the data best, an ideal solution is the most parsimonious model that has an acceptable fit to the observed data. As a result, the objective of determining model fit does not necessitate that fit statistics bottom out. Instead a model should be selected when it is interpretable or substantively meaningful and parsimonious (Cleveland et al., 2013; Snyder & Smith, in press). Thus, the findings from prior literature helped with the process of determining the best model (Collins & Lanza, 2010).

We also assessed the models using entropy statistics, which are model usefulness statistics that should be as close to one as possible. In addition to evaluating fit statistics, we examined plots of each class' results to determine which number of classes intuitively makes sense (Nylund, Bellmore, Nishina, & Graham, 2007; Snyder & Monroe,2013; Snyder & Smith, 2014). Lastly, we followed Khan et al.'s (2014) approach of examining class prevalence and preferring classes that accounted for 5% or more of the sample because this improved the reliability of estimates.

Attrition analysis

We used chi-square tests and *t* tests on the unweighted sample of 14,081 emerging adults with weights, stratification, and cluster variables to conduct an attrition analysis comparing the analytic sample (11,117) and the attrited cases (2,964). We found that the attrited cases contained more males ($\chi^2(1, 14{,}079) = 7.39$, $p < 0.01$); were more likely to be Black ($\chi^2(1, 14{,}056) = 7.39$, $p < 0.001$); and were more depressed ($t = 3.52$, $p < 0.01$). Regarding alcohol use and related problems, the analytic sample included more individuals who had drank five or more drinks during the past two weeks ($\chi^2(1, 14{,}072) = 12.33$, $p < 0.001$); who had experienced problems with dating because of drinking ($\chi^2(1, 10{,}061) = 7.32$, $p < 0.01$); and who had experienced a hangover ($\chi^2(1, 10{,}038) = 8.40$, $p < 0.01$). The attrited cases included more individuals who had driven drunk ($\chi^2(1, 14{,}072) = 26.66$, $p < 0.001$).

Results

Table 1 provides the sample characteristics and indicates some noteworthy differences between genders. Compared to males, females were more educated, more likely to be in a serious romantic relationship, more likely to live outside of their parents' home, and they reported more depression symptoms. Males were more likely to have engaged in adolescent delinquent behaviors.

Table 2 provides the prevalence of each alcohol use behavior used to form the latent class structure for both genders, and the total sample. Because of physiological differences binge drinking was measured as four drinks for females and five drinks for males. Males were significantly more likely to engage in each of the alcohol risk behaviors. For males the most frequent behavior was *drinking five or more drinks in the past 2 weeks* (69.62%). For females the most frequent behavior was *experiencing a hangover* (56.76%). The least frequent behavior for females was *being drunk at school or work* (3.65%), while the least frequent behavior for males was *experiencing problems at school or work* (6.60%).

For both males and females, the results of the LCA for each of the seven classes is provided in Table 3. The top row provides the fit indices used to evaluate the models and the distributions across the classes. The left-hand side provides the number of classes in the model. For females we chose the three-class solution and for males we chose the 4-class solution. The decisions for the class solutions were based on the best fit, interpretability, and parsimony.

Figures 1 and 2 visually depict the item-response probabilities for each of the alcohol-use behaviors for males and females respectively. For males we found the following four classes:

(1) multiple-risk drinkers, (2) moderate-risk drinkers, (3) binge-drinkers, and (4) low-risk drinkers or abstainers. In the first class, respondents reported binge drinking within the past 2 weeks and a range of associated risks, including problems at school or work, problems with friends, problems dating, regretting a sexual situation, and driving drunk. Participants in the second class have experienced problems at school or work because of drinking, have had a hangover, have regretted a sexual situation, and have driven drunk. In the third class members had drank five or more drinks, had experienced a hangover, and had driven drunk. The fourth class includes members who consumed small amounts of alcohol or abstained from drinking.

For females, we found the following three classes: (1) multiple-risk drinkers, (2) moderate-risk drinkers, and (3) low-risk drinkers or abstainers. Members of the first class had the highest probabilities of all risk behaviors. Members of the second class had high probabilities of binge drinking, hangovers, regretting a sexual situation, and drunk driving. The probabilities of risk behaviors among the third group were the lowest for all measures.

The results of regressing the covariates onto the classes using the three step method are presented as odds ratios (ORs) and 95% confidence intervals in Table 4 for males and Table 5 for females. For both males and females the low-risk drinkers or abstainers latent class functions as the reference.

Male emerging adults who were white, single, and did not live with their parents had significantly higher odds of being in the multiple-risk behaviors class compared to being in the low-risk drinkers or abstainers' class. The odds were significantly higher of being in the multiple-risk behaviors class compared to being in the low-risk drinkers or abstainers' class among emerging adult males who were depressed (OR = 1.36, $p < 0.01$, 95% CI [1.11–1.68]), who had experienced child supervisory neglect (OR = 2.16, $p < 0.05$, 95% CI [1.11–4.21]), and who had engaged in adolescent delinquency (OR = 1.92, $p < 0.001$, 95% CI [1.53–2.41]). Males who were single, with a parent who reported drinking 5 or more drinks on a single occasion, or had engaged in adolescent delinquency had significantly higher odds of being in the moderate-risk behaviors class compared to the referent group. Being less educated and living with parents also increased the odds of membership in the binge-drinkers class compared to the referent group. Additionally, compared to the referent group, males had lower odds of being members of the binge-drinkers class if they were white.

For female emerging adults, being white, older, more educated, or in a serious romantic relationship increased the odds of membership in the multiple-risk behaviors class compared to being in the low-risk drinkers or abstainers' class. Likewise, females who were depressed (OR = 1.41, $p < 0.05$, 95% CI [1.06–1.89]), had experienced child supervisory neglect (OR = 2.41, $p < 0.05$, 95% CI [1.22–4.77]), or had engaged in adolescent delinquency (OR = 2.01, $p < 0.001$, 95% CI [1.50–2.70]) had higher odds of being in the multiple-risk behaviors class compared to the referent group.

Discussion

Applying the social development model, this study used data from Wave III of Add Health to investigate how the effect of child supervisory neglect on alcohol use during emerging adulthood differed based on gender. Our study controlled for risk and protective factors that have been linked with alcohol use, such as depression (Dixit & Crum, 2000; Weitzman, 2004), engaging in adolescent delinquency (cf. Guo et al., 2001; Hunter et al., 2014; Williams et al., 2007), being single (Fleming et al., 2010; Snyder & Rubenstein, 2014), parental drinking (White & Jackson, 2004; Wilson & Widom, 2010), living with parents (Gfroerer et al., 1997; White et al., 2006), and identifying as white (Chen et al., 2009). Our study is the first to examine how child supervisory neglect affects patterns of alcohol use differentially among male and female emerging adults.

Our first hypothesis is supported because both the male and female models demonstrated similar results to prior studies (cf. Beseler et al., 2012; Cleveland et al.,2013). The four class model we identified for males consisted of (1) multiple-risk drinkers, (2) moderate-risk drinkers, (3) binge-drinkers, and (4) low-risk drinkers or abstainers. The three class model identified for females consisted of (1) multiple-risk drinkers, (2) moderate-risk drinkers, and (3) low-risk drinkers or abstainers.

We found partial support for our second hypothesis. Consistent with the literature on general neglect (Patock-Peckham and Morgan-Lopez, 2010; Mullings et al., 2004), for both males and females, child supervisory neglect more than doubled the odds of membership in the multiple-risk drinkers class compared to low-risk drinkers or abstainers class. However, supervisory neglect did not increase the odds of membership in other classes for either male or female emerging adults. This finding suggests experiencing supervisory neglect is associated with a greater likelihood of engaging in the most deleterious combination of behaviors as opposed to regulating drinking behaviors. Future research should consider assessing the nuances of neglectful supervision that leads to an inability to moderate alcohol use as an emerging adult.

Similar to the findings of prior studies (Dixit & Crum,2000; Harrell & Karim, 2008; Weitzman, 2004), depression increased the odds of membership in the multiple-risk drinkers class compared to the referent class for both males and females. Depression raised the odds of moderate-risk drinkers for male emerging adults, but not for females. Dixit and Crum (2000) found that a history of depressive disorder more than doubled the risk of heavy drinking in women. So it may be that depressed women generally do not moderate their drinking. Alternatively, it could be that similar to the findings of Lee et al. (2012), that males' alcohol risk behaviors do not vary with depression as dramatically as females' risk behaviors do. The results pertaining to depression should be interpreted with caution because a single depression measure was used at one point in time, which does not capture past or future episodes of depression.

Also consistent with the literature (cf. Guo et al., 2001; Hunter et al., 2014; Williams et al., 2007), for both males and females, adolescent delinquency increased the odds of membership in the multiple-risk drinkers class compared to low-risk drinkers or abstainers

class. For males only adolescent delinquency also increased the odds of membership in the moderate-risk drinkers' class. One explanation for this gender difference is that males are more likely to engage in adolescent delinquent behaviors (Connell et al., 2011; Farrington et al., 2010; Schwartz et al., 2010).

Interestingly, parent-reported parental heavy drinking at Wave I only increased the odds of membership in the multiple-risk drinking class for males, but did not have a relationship to class membership for females. Perhaps many emerging adults who have seen a parent abuse alcohol are less likely to abuse alcohol themselves. Another explanation for these results contrary to prior studies (White & Jackson, 2004) is that parents may not have answered the question regarding their drinking behavior accurately. These results should also be interpreted with caution because the measure captured responses from mothers, grandmothers and others who may be less likely to drink five or more drinks at a time. The fathers who were largely absent from this measure have been linked to female heavy drinking in Dixit and Crum's (2000) study.

Similar to prior studies (Fleming et al., 2010; Snyder & Merritt, 2015; Snyder & Rubenstein, 2014), for males being single raised the odds of multiple-risk drinkers' class membership and moderate-risk drinkers' class membership. These findings suggest that serious romantic relationships are especially protective for males. However, for females being single reduced the odds of being in the multiple-risk drinkers class. The interpretation of these findings is complicated by the lack of information on the quality of the relationship (see Fleming et al., 2010). It may be that the female respondents were unhappy in their relationships and used alcohol to self-medicate. In addition, we do not have information regarding partners' substance use behavior. So it may be that males reduce their alcohol risk behavior because they enter a relationship with a female who engages in few alcohol risk behaviors, while females could increase their alcohol risk behaviors in response to having a partner who engages in multiple risk behaviors.

Consistent with the findings of White et al. (2006) and Gfroerer, Greenblatt, and Wright (1997), living with a parent was a protective factor for males and decreased the odds of multiple-risk drinkers' class membership. However, it was not protective for other male classes or for any female classes. It is likely that this finding only applies to males who did not have a parent who reported binge drinking. Males living at home had increased odds of being in the binge drinking class compared to the referent class. On the one hand, it may be that males who reside with their parents may engage in less risky drinking behaviors because of parental oversight. Alternatively, the protective nature of living with parents may not have been as strong for alcohol as it may be for other substances since the use of alcohol is more socially acceptable.

For both males and females, consistent with the literature, being white (Chen et al., 2009) was a risk factor that significantly increased the odds of membership in either the multiple-risk drinkers or the moderate-risk drinkers' classes. Simultaneously, white males also had a lowered risk of membership in the binge drinking class. Perhaps binge-drinking for males is more of a normative behavior that transcends racial differences. Less educated males had increased odds of membership in the binge-drinking class. For females only, being older and

being more educated increased the odds of membership in the multiple-risk drinkers' class. This seems to suggest that risk behaviors associated with college-life or later stages of emergence to adulthood may be especially pronounced for females.

Implications

Although alcohol risk behaviors among emerging adults constitute a complicated issue, important steps can be taken to address the problem in the realms of research, practice, and policy. Starting with research, future studies should replicate this study to explore these relationships during adolescence, middle, and late-adulthood. Ideally researchers should conduct longitudinal studies that examine how these relationships change over time. It would also be informative if qualitative researchers would explore how and why child supervisory neglect influences alcohol use among male emerging adults, in addition to a nuanced assessment regarding the range of behaviors associated with neglect. Clinicians who are treating emerging adults for alcohol abuse should ask clients about child supervisory neglect. Finally, policies should be enacted that fund programs designed to address the mental health needs of victims of supervisory neglect prior to emerging adulthood.

While our study has several strengths, we did not examine how the relationships between alcohol use and child supervisory neglect change over time. Many of the findings presented in this study are cross-sectional so cause and effect cannot be established. Additionally, it would have been informative if there had been more questions regarding various forms of neglect similar to the Mullings et al. (2004) study, questions regarding the ages at which time neglect occurred, the frequency of neglect, and the features of the neglectful family. Another limitation is that recall bias could have affected the response rate and correctness of responses. Hopefully, future studies can build on the work of this study to further our understanding of the effects of the most prevalent form of maltreatment in the United States on risky alcohol use behaviors.

Notes on contributors

Susan M. Snyder, Ph.D., is an Assistant Professor in the School of Social Work at the Georgia State University. Dr. Snyder's work focuses on problem behavior, including substance use and illegal behaviors among system-involved youth and emerging adults. Her work contributes to the understanding of the correlates associated with typologies of cooccurring problem behaviors.

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Glossary

Latent class analysis (LCA)	LCA is a person-centered analytic approach that uses maximum likelihood procedures to comb through the dataset and identify homogenous subgroups of individuals drawn from a larger heterogeneous sample or population, at a single point in time.
Supervisory neglect	Supervisory neglect constitutes situations when adult supervision of a child is inadequate to meet the child's needs.

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Figure 1.
Weighted profile plot of alcohol risk behaviors classes for females.

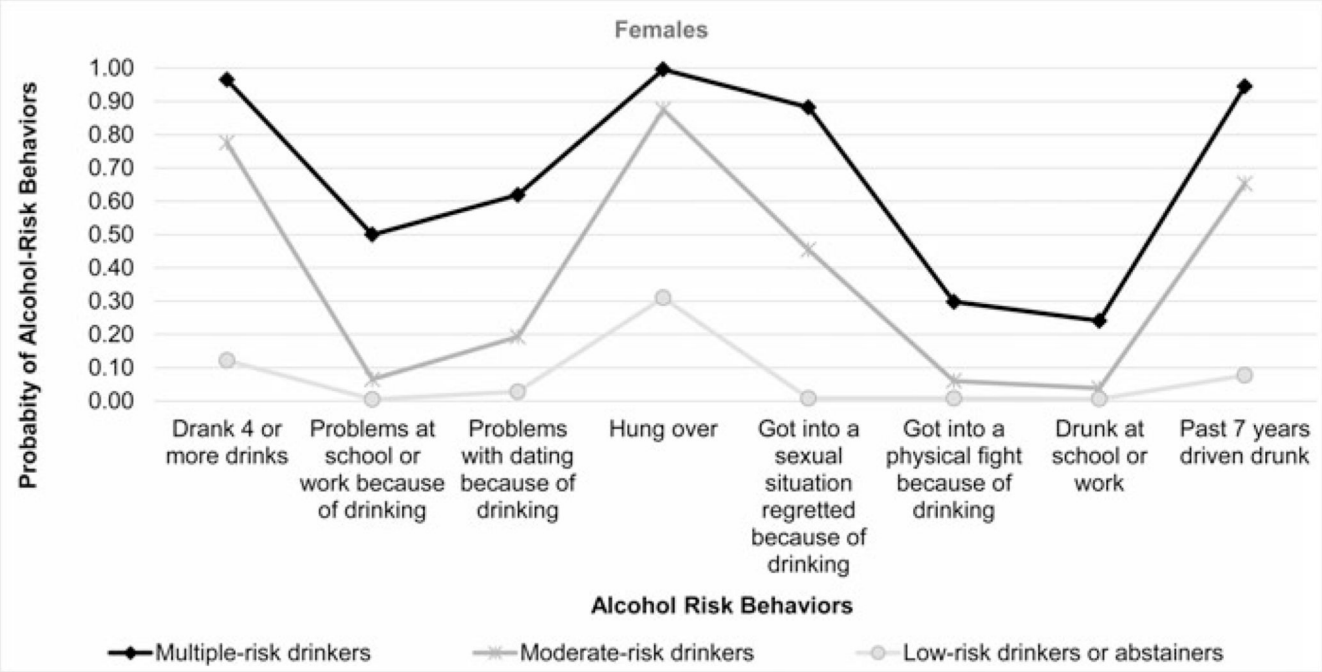

Figure 2.
Weighted profile plot of alcohol risk behaviors classes for females.

Table 1

Weighted sample characteristics for male and female respondents.

	Female			Male					
	Unweighted *n*	**% or mean**	**(SE)**	**Unweighted *n***	**% or mean**	**(SE)**	***F***	***df***	***p* value**
Actual sample size *	5,949	49.99		5,168	50.01				
Race									
Asian/Pac. Island.	291	2.52		296	2.81		0.98	1,942	> 0.05
Black	1,228	14.57		934	13.61				
White	3,653	72.74		3,241	72.51				
Other	777	10.17		697	11.07				
Hispanic									
Yes	885	10.81		831	11.66		1.04	1,942	> 0.05
Education									
< High school	440	8.54		522	11.93		12.15	1,942	< 0.001
High school/GED	4,212	71.49		3,818	73.48				
Some college	457	6.95		338	5.56				
College	788	12.09		459	8.43				
Beyond college	52	0.92		31	0.59				
Relationship status									
Single	3,824	62.68		3,756	72.81		41.22	1,942	< 0.001
Cohabitation	1,181	19.96		704	12.74				
Married	944	17.36		708	14.45				
Living situation									
Parents	2,242	36.85		2,314	44.96		13.83	1,942	< 0.001
Another's home	322	4.94		283	5.39				
Own place	3,054	52.63		2,274	44.18				
Group quarters	298	5.17		253	4.52				
Other	33	0.42		44	0.95				
Supervisory neglect **									
Yes	449	7.49		450	7.78		0.21	1,942	> 0.05
Parental drinking ***									
Yes	714	12.46		627	14.10		3.31	1,942	> 0.05
Mean Age	5,949	21.61	(0.04)	5,168	21.72	(0.04)	6.35	1,942	< 0.05
Mean delinquency ****	5,949	0.23	(0.01)	5,168	0.32	(0.01)	105.10	1,942	< 0.001
Mean depression *****	5,949	6.11	(0.09)	5,168	4.70	(0.08)	143.11	1,942	< 0.001

Note. Above are frequencies for categorical variables and means and standard errors for continuous variables. Some numbers may not sum to 100 due to rounding. Also, to compute the *F* statistic, degrees of freedom, and *p* value for the comparisons across gender for categorical variables, we used the svy: tab command; and for continuous variables, we used the svy: mean command followed by the test command.

*The weighted sample consists of 8,734,994 females and 8,739,895 males.

**During Wave III respondents were asked to retrospectively answer one question regarding experiences prior to the 6th grade: "How often had your parents or other adult caregivers left you home alone when an adult should have been with you?" Ten or more experiences of neglect were valued as 1.

***Parental drinking is a dichotomous measure capturing whether parents had consumed five or more alcoholic drinks on one occasion in the past month (1 = yes) during Wave I.

****During Wave I respondents answered 15 questions regarding delinquent behaviors with ranges from 0 = never to 3 = five or more times; then scores were averaged, then standardized ($M = 0$; $SD = 1$).

*****The CES-D is scored as follows: <10 indicates no depression; 10–14 indicates mild depression; and >14 indicates severe depressive symptoms. Scores ranged from 0 to 28. The values presented for depression are mean values.

Table 2

Weighted percentage of respondents indicating engagement in alcohol-related behaviors.

	Unweighted *n*	Female %	Unweighted *n*	Male %	*F*	*df*	*p* value
Drank ≥ 4 drinks past 2 weeks	3,131	53.70					
Drank ≥ 5 drinks past 2 weeks			3,534	69.62			
Problems at school or work because of drinking past 12 months	263	6.60	425	11.21	29.20	1,712	<0.001
Problems with dating because of drinking past 12 months	535	13.45	622	16.76	10.09	1,712	<0.01
Hung over past 12 months	2,334	56.76	2,453	63.98	22.96	1,710	<0.001
Got into a sexual situation regretted because of drinking	547	20.04	660	27.01	22.08	1,512	<0.001
Got into a physical fight because of drinking	203	5.00	652	18.31	231.59	1,703	<0.001
Drunk at school/work past 12 months	154	3.65	429	11.69	106.31	1,713	< 0.001
Driven drunk past 7 years	2,702	46.38	2,987	58.80	89.64	1,942	< 0.001

Note. Unless otherwise indicated values are based on the weighted sample. Unless otherwise indicated the behavior took place during the past 12 months. There are not comparisons between the first two items because binge drinking for females is four or more drinks, while binge drinking for males is five or more drinks.

Table 3

Indicators of fit with one through seven latent classes by sex.

	Females							Males					
	LL	**BIC**	**AIC**	**Entropy**	**Class *n***	**Class %**		**LL**	**BIC**	**AIC**	**Entropy**	**Class *n***	**Class %**
1	−16,932.37	33,934.26	33,880.73		5,949	100.00	1	−17,176.99	34,422.39	34,369.99		5,168	100.00
2	−14,663.96	29,475.66	29,361.91	0.76	2,793	46.95	2	−15,346.21	30,837.78	30,726.42	0.67	2,173	42.05
					3,156	53.05						2,995	57.95
3	**−14,518.47**	**29,262.91**	**29,088.95**	**0.61**	**303**	**5.09**	3	−15,149.79	30,521.88	30,351.57	0.57	567	10.96
					2,444	**41.08**						1,376	26.63
					3,203	**53.84**						3,225	62.40
4	−14,450.30	29,204.78	28,970.59	0.65	233	3.92	**4**	**−15,104.34**	**30,507.93**	**30,278.68**	**0.52**	**524**	**10.15**
					311	5.23						**642**	**12.43**
					2,386	40.10						**1,389**	**26.87**
					3,019	50.75						**2,613**	**50.56**
5	−14,425.93	29,234.26	28,939.86	0.62	11	0.18	5	−15,066.29	30508.78	30,220.57	0.49	279	5.40
					297	5.00						526	10.18
					364	6.12						609	11.78
					2,393	40.23						1,397	27.04
					2,883	48.47						2,357	45.61
6	−14,411.90	29,284.43	28,929.81	0.64	10	0.17	6	−15,036.50	30,526.16	30,179.00	0.51	314	6.07
					18	0.31						352	6.81
					353	5.93						373	7.21
					1,185	19.93						452	8.74
					1,952	32.81						1,402	27.12
					2,430	40.86						2,276	44.04
7	−14,400.10	29,339.04	28,924.20	0.64	11	0.18	7	−15,020.09	30,570.29	30,164.18	0.57	160	5.69
					30	0.51						189	7.34
					188	3.16						202	8.28
					277	4.66						255	9.26
					332	5.58						672	10.69
					2,414	40.58						1,357	13.75

Females						Males					
LL	**BIC**	**AIC**	**Entropy**	**Class *n***	**Class %**	**LL**	**BIC**	**AIC**	**Entropy**	**Class *n***	**Class %**
				2,697	45.33					2,333	44.99

Note. LL = Log Likelihood; AIC = Aikaike Information Criteria; BIC = Bayesian Information Criteria; BIC SSA = sample-size-adjusted BIC LRT = Lo-Mendell Rubin Test. The three class model is boldfaced to indicate that it was the model chosen for females and the four class model is boldfaced to indicate the model chosen for males.

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Table 4

Males odds ratios comparing multiple-risk drinkers, moderate-risk drinkers, and binge-drinkers to the low-risk drinkers or abstainers.

	Multiple-risk drinkers vs. low-risk drinkers or abstainers		Moderate-risk drinkers vs. low-risk drinkers or abstainers		Binge drinkers vs. low-risk drinkers or abstainers	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Hispanic	0.53	[021–1.34]	1.38	[0.81–2.35]	0.72	[0.42–1.24]
White	2 81***	[1.42–5.57]	1.60***	[1.02–2.53]	0.67*	[0.46–0.97]
Wave 3 age	0.88	[0.71–1.09]	0.88	[0.70–1.10]	1.08	[0.91–1.29]
Wave 3 education	1.02	[0.83–1.26]	1.02	[0.83–1.26]	0.70**	[0.56–0.88]
Wave 3 single	5.56***	[2.86–10.81]	1.72*	[1.01–2.94]	0.81	[0.55–1.19]
Wave 3 live with parent(s)	0.46***	[0.30–0.69]	1.08	[0.72–1.64]	1.48*	[1.01–2.16]
Wave 3 child supervisory neglect	2.16*	[1.11–4.21]	0.93	[0.44–1.99]	1.22	[0.68–2.20]
Wave 1 parental drinking	0.74	[0.41–1.33]	1.61*	[1.02–2.54]	1.30	[0.77–2.19]
Wave 3 depression	1.36**	[1.11–1.68]	1.44***	[1.18–1.76]	1.19	[0.99–1.43]
Wave 1 delinquency	1 92***	[1.53–2.41]	1.34**	[1.10–1.63]	0.79	[0.58–1.07]

Note. Low-risk drinkers or abstainers are the referent for multiple-risk drinkers, moderate-risk drinkers, and binge-drinkers. Hispanic was equal to 1 for individuals who responded *yes* to a question asking if they were of Hispanic decent and zero for those who responded *no*. Thus, the referent group for Hispanics was non-Hispanics. Because of their low substance use during emerging adulthood, white was given a value of 1 and the referent group contained individuals who identified as Asian/Pacific Islander, black and other.

*$p < 0.05$,

**$p < 0.01$,

***$p < 0.001$.

Table 5

Females' odds ratios comparing multiple-risk drinkers and binge-drinkers to the low-risk drinkers or abstainers.

	Multiple-risk drinkers vs. low-risk drinkers or abstainers		Binge drinkers vs. low-risk drinkers or abstainers	
	OR	**95% CI**	**OR**	**95% CI**
Hispanic	0.57	[020–1.62]	1.18	[0.87–1.61]
White	13.68***	[4.23–44.26]	1 85***	[1.44–2.37]
Wave 3 age	1.68***	[1.20–2.36]	1.40**	[1.21–1.63]
Wave 3 education	6.30***	[2.71–14.65]	1.13	[0.83–1.52]
Wave 3 single	0.57*	[0.34–0.98]	0.95	[0.74–1.22]
Wave 3 live with parent(s)	1.07	[0.33–3.45]	1.27	[0.76–2.12]
Wave 3 child supervisory neglect	2.41*	[1.22–4.77]	1.03	[0.71–1.49]
Wave 1 parental drinking	0.95	[0.68–1.34]	0.97	[0.85–1.11]
Wave 3 depression	1.41*	[1.06–1.89]	1.04	[0.92–1.18]
Wave l delinquency	2.01***	[1.50–2.70]	1.13	[0.96–1.34]

Note. Low-risk drinkers or abstainers are the referent for both multiple-risk drinkers and binge-drinkers. Hispanic was equal to 1 for individuals who responded *yes* to a question asking if they were of Hispanic decent and zero for those who responded *no*. Thus, the referent group for Hispanics was non-Hispanics. Because of their low substance use during emerging adulthood, white was given a value of 1 and the referent group contained individuals who identified as Asian/ Pacific Islander, black, and other.

*$p < 0.05$,

**$p < 0.01$,

***$p < 0.001$.