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Adolescent Work and Alcohol Use: Moderation by Neighborhood Context and the Role of Peers

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ABSTRACT

Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), this study looks at the adolescent work and binge drinking relationship among a sample of 4,826 adolescents. The paper assesses variability in the work-binge drinking relationship by social class and neighborhood disadvantage and seeks to explain variability by considering social control and social learning processes. Results reveal that the detrimental relationships between work intensity and binge drinking are stronger for those from more advantaged neighborhoods. Results also show that perceived peer substance use explains neighborhood disadvantage differences in the relationship between intense work and binge drinking.

KEYWORDS: adolescent work; substance use; social class; criminological theory

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Despite recent declines (Johnston et al. 2011), the extent to which adolescents are exposed to and use substances remains a concern for researchers, policy-makers, and parents. Considering two of the more prominent substances, recent data has shown that about 27.5% of 10th graders report using marijuana over the past year and 52.1% report consuming alcohol (Johnston et al. 2011). Substance use is an especially important issue for the many adolescents who work, particularly during the school year (Paschall et al. 2004; Valois et al. 1999).

As a critical period that sets the stage for the transition to adulthood, adolescent work is an important component of an adolescent's larger socioeconomic pathway. Thus, the meaning of adolescent work is likely shaped by one's position within the social structure (Mortimer 2003). Yet few studies have examined how the relationship between adolescent work and substance use varies across subgroups of the population (for exceptions see Bachman et al. 2013; Rocheleau and Swisher 2012). Another limitation of previous research is that the extent to which mechanisms explain differences in the relationship between adolescent work and delinquency has not been tested.

This study uses data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) to examine variations in the relationship between adolescent work and binge drinking by socioeconomic status and neighborhood disadvantage. This study also attempts to explain observed differences in this relationship by considering the mediating role of social control and social learning processes, using mediated moderation techniques (Muller et al. 2005).

BACKGROUND

Adolescent Work, Social Class, and Neighborhood Disadvantage

Numerous studies have observed a positive association between adolescent work and delinquency (Apel et al. 2006; Bachman and Schulenberg 1993; Brame et al. 2004; Johnson 2004; McMorris and Uggen

2000; Mihalic and Elliott 1997; Mortimer 2003; Staff and Uggen 2003; Steinberg and Dornbusch 1991).

Substance use, in particular, has been the focus of many of the above studies. One question that remains relatively unanswered, however, is the degree to which the relationship between adolescent work and substance use varies across socioeconomic and demographic subgroups of the population.

Research is increasingly recognizing that decisions about work are not made within a vacuum, but rather reflect adolescent aspirations and expectations regarding their socioeconomic futures. For example, research has shown that social class is related to patterns of work in adolescence (Keithly and Deseran 1995; Warren and Lee 2003). Low levels of employment are often observed among poorer African-American adolescents (Entwisle et al. 1999; Entwisle et al. 2000; Leventhal et al. 2001; O'Regan and Quigley 1996); however, when those from lower SES backgrounds are able to find work, they tend to work longer hours (Staff and Mortimer 2007; Warren and Lee 2003).

Mortimer (2003) has considered how social class affects the transition to work among adolescents by identifying two distinct pathways of preparation for adult roles and careers: one through the workplace, where adolescents are less engaged in school and work longer hours; and another through the educational system, where adolescents are more engaged in school and work less intensively. Specifically, Mortimer found that those from disadvantaged backgrounds are more likely to pursue the work-intensive pathway (Mortimer 2003; Staff and Mortimer 2007). Further evidence of different approaches to work based on socioeconomic status was garnered by Rocheleau (2015), who found that, among those from disadvantaged neighborhoods, the more planful (i.e., the extent to which decisions are thought through in advance) and college-expecting youth were more likely to work intense hours compared to others; but among those from advantaged neighborhoods, it was the less planful and college-expecting youth who were more likely to work intense hours compared to others.

The voluminous literature on the social and economic disadvantages of growing up within poor neighborhoods (e.g., Figueira-McDonough 1993; Leventhal and Brooks-Gunn 2000; Sampson et al. 2002; Shihadeh 2009; Wilson 1997) also suggests the importance of considering how neighborhood advantage may moderate the adolescent work and substance use relationship. For example, with respect to

employment, Vartanian (1999) found youth growing up in the most disadvantaged neighborhoods to have considerably lower rates of employment and poorer wages in adulthood. Thus, gaining an economic foothold through adolescent employment may be particularly important for youth from disadvantaged neighborhoods, representing a very real opportunity for status attainment. Youth from more advantaged backgrounds, on the other hand, may view work more in terms of its short-term and social benefits.

In regard to potential social or peer influence, adolescent work may be more detrimental for those from advantaged backgrounds. Some previous research supports this idea, finding that the positive relationship between adolescent work and delinquency is limited to those from more advantaged backgrounds (Bachman et al. 2013; Bauermeister et al. 2007; Breslin and Adlaf 2005; Johnson 2004; Rocheleau and Swisher 2012). Focusing on family structure, Rocheleau and Swisher (2012) found that the positive relationship between work and drinking was stronger for adolescents residing in two-biological-parent households, whereas a negative association was observed among youth from single-parent households (see also Bachman et al. 2013). With respect to racial and ethnic differences, Johnson (2004) found a positive relationship between work and substance use among white adolescents, but no consistent relationship among minority adolescents. Research explicitly examining variations in the relationship between adolescent work and substance use or delinquency by social class have produced mixed findings (Bachman et al. 2013; Breslin and Adlaf 2005; Steinberg and Dornbusch 1991; Weller et al. 2003). Finally, the only study to consider how neighborhood disadvantage may moderate the adolescent work-substance use relationship found no significant variability by neighborhood disadvantage in a sample of youth from various neighborhoods in Chicago (Kingston and Rose 2015).

We are unaware of any studies that have explicitly examined whether neighborhood disadvantage moderates the relationship between adolescent work and substance use using nationally representative data. Thus, the present study seeks to contribute by examining the extent to which family social class and neighborhood disadvantage moderate the relationship between work intensity and substance use using nationally representative data. Given the somewhat mixed findings of previous research, we tentatively

hypothesize that the deleterious associations between adolescent work and binge drinking will be more pronounced for those from advantaged backgrounds.

Explaining the Varying Relationship between Adolescent Work and Substance Use

Even more limited are studies that have sought to explain why the relationship between adolescent work and substance use varies across subgroups. In other words, we know very little about what accounts for, or mediates, the moderated relationship between work and substance use across contexts. Previous studies have offered speculation. For example, Rocheleau and Swisher (2012) reasoned that work may be less detrimental to youth from single-parent families (in comparison to two-biological-parent families) because these youth are already at-risk for lower parental supervision and more unstructured socializing with potentially deviant peers, as previous research indicates lower levels of social bonds and higher levels of deviant peer association among this group of youth compared to others (Chen and Kaplan 1997; Mack et al. 2015). The present study thus seeks to empirically examine this question of "mediated moderation" (Muller et al. 2005), motivated by leading theories of crime and delinquency.

One set of processes that may explain differences in the relationship between adolescent work and substance use is suggested by social control theory (Hirschi 1969). Hirschi argued that individuals who are more strongly connected to conventional society are more likely to refrain from engaging in crime and deviance. Hirschi identified the following elements of the social bond: attachment, where the affection to others serves to control antisocial behavior; commitment, where the degree to which individuals have a stake in conformity serves to control antisocial behavior; involvement, where having restricted opportunities constrains antisocial behavior; and belief, where the extent to which individuals buy into the rules of conventional society limits antisocial behavior.

While adult work is generally thought to increase social bonds through greater economic stakes in conformity and a reduction of free time (Sampson and Laub 1990), adolescent work has largely been related to decreases in social bonds as it takes place away from parental supervision and may take time away from educational and extra-curricular pursuits in other domains. Many studies have found youth working significant hours during the school year have lower levels of school performance and

involvement (Apel et al. 2008; D'Amico 1984; Largie et al. 2001; Marsh 1991; Roisman 2002; Safron et al. 2001; Steinberg and Dornbusch 1991; Tyler 2003; Warren and Lee 2003). That adolescent work undermines social bonds within the family is also strongly suggested by previous research (Manning 1990; Mihalic and Elliott 1997; Mortimer and Shanahan 1994; Pickering and Vazsonyi 2002; Shanahan et al. 1996; Steinberg and Dornbusch 1991; Steingberg et al. 1982; Steinberg et al. 1993). Some research has found parental measures such as these to largely mediate the relationship between adolescent work and substance use (Longest and Shanahan 2007; McMorris and Uggen 2000; Staff et al. 2010).

Social learning theory offers alternative mechanisms that may explain differences in the relationship between adolescent work and substance use (Burgess and Akers 1966; Sutherland 1947). The theory asserts that antisocial behavior, like any other behavior, is learned through interactions with individuals and environments. Work in adolescence may lead to increases in antisocial behavior by providing antisocial learning opportunities. For instance, by working with older peers and young adults, work may expose adolescents to more deviant and substance-using social networks compared to the more age-restrictive networks within schools. Such deviant social networks can reinforce or fail to deter antisocial behavior, "normalize" antisocial behaviors, and provide models for antisocial behavior, particularly in the case of adult-like behaviors such as substance use. Moreover, independence from parents and schools may also remove the influence of more pro-social role models and peer networks. Working in adolescence, especially with great intensity, may thus expose adolescents to definitions favorable of antisocial behavior, thereby increasing their substance use.

Some empirical support for social learning theory has been garnered. For example, adolescent work has been found to be associated with increased exposure to delinquent peers (Ploeger 1997), perceived drinking norms (Paschall et al. 2002), and increased anti-social beliefs (Mihalic and Elliott 1997; Steinberg et al. 1982). Previous research has found social learning measures to mediate much of the relationship between adolescent work and delinquency (Ploeger 1997), including alcohol use (Paschall et al. 2002). Moreover, research by Staff et al. (2010) found that, when controlling for within person

heterogeneity and preferences to work, the significant relationships between adolescent work intensity and heavy alcohol use was mediated by unstructured socializing.

Social control and learning mechanisms may not only explain the work-substance relationship, but also variation in this relationship by social class and neighborhood disadvantage. Considering social control, it could be that work appears to be especially detrimental to those from advantaged backgrounds (Bachman et al. 2013; Bauermeister et al. 2007; Breslin and Adlaf 2005; Johnson 2004; Rocheleau and Swisher 2012) because it does more damage to the social bonds in work and school domains of advantaged youth relative to disadvantaged youth. With stronger social bonds to family, school, and community (Lareau 2003; Sampson et al. 1999; Sampson et al. 1997; Vowell and Howell 1998) those from more advantaged backgrounds simply have more to lose by working a lot of hours in adolescence.

Using a social learning theoretical framework, it is possible that the effect of work on substance use is stronger for those from advantaged backgrounds because it exposes them to a more delinquent peer network. Compared to more disadvantaged neighborhoods, research has found that, contrary to violent delinquency (Haynie et al. 2006) more advantaged neighborhoods have higher rates of adolescent substance use (Krieg and Kuhl 2016; Snedker et al. 2009). Such findings have led some researchers to argue that the exposure to the pitfalls of substance use have served as a protective factor to disadvantaged youth by increasing the stigma of the behavior, such as with the application of the "crack head" label (Furst et al. 1999). If adolescents are working in jobs near the neighborhoods in which they reside in, then those from more advantaged backgrounds would be more likely to interact with adolescent coworkers with higher levels of substance use compared to others. Also, if those from disadvantaged backgrounds are taking a more planful and strategic approach to work than those from advantaged backgrounds (Mortimer 2003; Rocheleau 2015; Staff and Mortimer 2007), then perhaps they are more likely to make work "work" in accordance with their familial and educational social bonds or they may be less likely to develop delinquent peer networks at work. Moreover, some research has found that the effect of deviant peers on substance use is lower for adolescents in more disadvantaged neighborhoods (Snedker et al. 2009) and that the effect of peers on substance use may be especially great among middle social class

adolescents (McGee 1992). So even if those from more disadvantaged backgrounds are exposed to substance using peers, they may be less influenced by them.

In summary, previous research has not been able to empirically explain differences in the relationship between adolescent work and substance use across subgroups of the population. Thus, the second major focus of this study to examine the mediating roles of social control and social learning processes in explaining social class and neighborhood differences in the relationship between adolescent work and alcohol use.

METHOD

Data and Sample

This study uses data from the first two waves of Add Health, a nationally representative sample of students in grades 7 to 12 in the United States. The original sampling frame included youth attending 145 junior and high schools. Students were stratified by grade and sex and randomly selected to participate in the longitudinal sample. The first wave of data collection began in 1994 – 1995, where 90,118 students completed in-school questionnaires. Of these respondents 20,745 students were interviewed from home (response rate of 78.9%). Nearly 15,000 students were interviewed from home about a year later in 1996 (response rate of 88.2%). Wave I seniors were not retained during this second wave of data collection.

Since the primary goal is to ascertain relationships between work and alcohol use, it is important that respondents are both old enough to work significant hours and young enough to still be considered in adolescence. Analyses are thus limited to those between the ages of 16 and 18 at Wave I. Also, the sample was limited to respondents who participated at both waves and for whom valid sampling weights are available. Finally, listwise deletion of a relatively small number of cases with missing data (no variable had more than 3% missing) on the explanatory and independent variables resulted in a final analytic sample of 4,826 adolescents.

Measures

Alcohol use. *Binge drinking* is based on the Wave II question: "Over the past 12 months, on how many days did you drink five or more drinks in a row?" Response categories initially ranged from "never;" "1 or 2 days in the past 12 months;" "once a month or less;" "2 – 3 days a month;" "1 or 2 days a week;" 3 to 5 days a week;" and "every day or almost every day." Since the majority of respondents did not report any binge drinking (64.99%), a dummy variable is created where any binge drinking is coded as 1 and never binge drinking is coded as 0. To partially capture potential selection effects, a Wave I measure of *prior binge drinking* is constructed in a similar fashion.

Adolescent work. Measures for adolescent work are based on the Wave I question "How many hours do you spend working for pay in a typical non-summer week?" As prior research suggests that the relationship between work and substance use may be non-linear (Paschall et al. 2004; Valois et al. 1999), categories for *non-worker* (0 hours), *moderate worker* (1 to 20 hours), and *intense worker* (21 or more hours) are created.

Social control. Social control variables expected to explain the relationship between work intensity and alcohol use are measured at Wave II to ensure that a respondent's work intensity temporally precedes the potential mediators. Family control measures are similar to those used by Demuth and Brown (2004). *Parental involvement* is based on adolescent reports of engagement in the following activities with each parent or parental figure within the past four weeks: gone shopping; played a sport; worked on a project from school; gone to a religious service or church-related event; and gone to a movie, play, museum, concert, or sports event. Each response is coded 1 if the adolescent engaged in that activity with parents and 0 otherwise. An index is created that takes the mean of the above items.

Parental attachment is based on adolescent responses to questions regarding their perceived relationship with each parent or parental figure in the household, including: how close do you feel to your mother/father; most of the time your mother/father is warm and loving to you; you are satisfied with the way your mother/father and you communicate with each other; and overall, you are satisfied with your relationship with your mother/father. Each response is measured on a 5-point scale ranging from low to high levels of attachment. An index is constructed that takes the mean of the items (alpha = 0.86). To

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account for those living with single parents, parental attachment and involvement are based on the highest value from either the mother or father for youth residing in two-parent households.

School involvement is based on adolescent responses to two questions regarding how many times they: were absent from school; and skipped school during the past year. For both questions, responses are reverse recoded so that fewer absences indicate greater school involvement. Those who reported missing more than 10 days of school are coded 0, those missing 3 to 10 days are coded 1, those missing 1 or 2 days are coded 2, and those missing no school are coded 3. A mean of the two items is created, which ranges from 0 to 3.

School attachment is based on adolescent responses to questions regarding the degree to which: "You feel close to people at your school;" "You feel like you are part of your school;" and "You are happy to be at your school." Each question is measured on a 5-point scale ranging from low to high levels of attachment. Again, an index is created that takes the mean of the above items (alpha = 0.78).

Social learning. This study assesses the social learning mechanism using a measure of *perceived peer substance use*. As with the social control mediators, this measure is obtained from Wave II so that work intensity is measured at an earlier period in time. Adolescents were asked how many of their three best friends: smoke at least 1 cigarette a day; drink alcohol at least once a month; and use marijuana at least once a month. Responses to each item thus range from 0 to 3. The mean of the three items is used to create an index (alpha = 0.73). This measure is similar to measures used by other studies that have attempted to capture exposure to delinquent peers, a key component of social learning theory (Paschall et al. 2002; Ploeger 1997; Warr 1993).

Social structural factors. Following Ford et al. (1999), *social class* is measured by combining Wave I parent reports of their educational attainment and employment status, producing a 10-point scale. When more than one parent is present in the household, the highest level of educational attainment and employment is used. Since there is some debate about the extent to which social class is linearly associated with deviance, especially with self-report data (Dunaway et al. 2000; Tittle and Meier 1990;

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Wright et al 1999), dummy variables for low, middle, and high social class groups are created based on taking 1 standard deviation above and below the mean.

Neighborhood disadvantage is based on 1990 Census data from the contextual files of Add Health, with neighborhoods operationalized as the census tracts within which adolescents were living at Wave I. Neighborhood disadvantage is assessed as the mean of three items: the proportion of households headed by single mothers; the proportion of households with less than $15,000 in annual income; and the proportion of persons ages 16 and older who are unemployed (alpha = 0.88). These items are similar to those used by Vazsonyi et al. (2006). For ease of interpretation, mean neighborhood disadvantage is multiplied by 100 so that a 1 unit increase or decrease represents a 1 percentage point change in neighborhood disadvantage. Like the measure for social class, indicator variables for low, middle, and high neighborhood disadvantage are created based on 1 standard deviation above and below the mean of neighborhood disadvantage.

Controls. All analyses control for the following characteristics: *age*, *gender*, and *race and ethnicity*. *Race and ethnicity* is based on respondent self-reports and yields mutually exclusive categories of: non-Hispanic White; non-Hispanic African-American; Hispanic; non-Hispanic Asian; and other. Additionally, models control for *family structure* and *grade point average*. Family structure is a dummy variable with respondents from two-biological-parent households coded 1 and those living in other family structures coded 0. The variable grade point average is based on self-reported grades in English or language arts, mathematics, history or social studies, and science from Wave I. Responses range from 0.50 to 4.00.

Analytic Strategy

All analyses are carried out using generalized hierarchical regression models in HLM and employ individual-level Add Health project weights (GSWGT2) to account for the complex sampling design (see Chen and Chantala 2014 for a detailed description of the use of Add Health weights). In the two-level models, individual characteristics are entered at level 1, whereas the neighborhood disadvantage measures

are entered at level 2. The first model examines the relationship between adolescent work and binge drinking while controlling for key background variables to simply establish a significant relationship. We then follow the procedures outlined in Muller et al. (2005) to formally test for "mediated moderation" using a series of regressions in HLM. First, variations in the relationships between intense work and binge drinking are assessed by incorporating interactions between work intensity and each social structural variable (i.e., social class and neighborhood advantage). Next, we examine if work and its interactions with social class and neighborhood disadvantage predict each social control and learning mechanism, a necessary step in establishing the potential for mediation. Finally, social control and social learning measures are then separately added to models predicting binge drinking to assess the degree to which these mechanisms account for social class and neighborhood disadvantage variations in the relationship between adolescent work and binge drinking.

RESULTS

Descriptive Statistics

Means and frequencies are reported in Table 1. Looking at the main independent variable, work intensity, Table 1 shows that 44.67% of adolescents report not working at all during the school year, 41.59% report work moderate hours during the school year, and just 13.74% report working intense hours during the school year. The Wave II alcohol use measure shows that 33.67% of adolescents have engaged in binge drinking over the past year. This percentage represents an increase from Wave I, consistent with age-crime curve expectations.

< Table 1 About Here >

Multivariate Moderation Models

Table 2 examines the possibility of moderation of the relationship between adolescent work and alcohol use by social class and neighborhood disadvantage. The first model just assesses the main association of adolescent work with binge drinking, net of controls. Results show that adolescent work is significantly

associated with binge drinking. Those who work intensely have a 57.4% increase in the odds of binge drinking compared to those who do not work at all. Noteworthy demographic differences in the likelihood of binge drinking are also observed. In particular, the likelihood of binge drinking increases with neighborhood advantage. Adolescents residing in disadvantaged neighborhoods report lower odds of binge drinking compared to those in moderately disadvantaged neighborhoods; whereas those residing in advantaged neighborhoods report the highest odds of binge drinking. In addition, females report lower odds of binge drinking compared to males, and both African American and Asian adolescents report lower odds of binge drinking compared to Whites. Furthermore, grade point average and prior levels of binge drinking also show expected relationships to binge drinking.

More central to our current study, models 2 and 3 test for the moderation of the relationship between work intensity and binge drinking by including interactions between work and both social class and neighborhood disadvantage, respectively. As seen in model 2, no significant differences in the relationship between work and binge drinking by social class are observed. In contrast, model 3 reveals that the relationship between adolescent work and binge drinking does vary significantly by neighborhood disadvantage. Consistent with our hypothesis, the detrimental effect of adolescent work on binge drinking is stronger for adolescents in more advantaged neighborhoods. For interpretive purposes, Figure 1 displays the predicted probability of binge drinking across categories of work intensity for adolescents in low, middle, and high levels of neighborhood disadvantage. As evident in the figure, there is little change in the predicted probability of binge drinking between no work and moderate work categories for those residing in relatively high disadvantaged and moderately disadvantaged neighborhoods, whereas those from relatively advantaged neighborhoods experience a substantial increase in the predicted probability of binge drinking.

< Table 2 About Here >

< Figure 1 About Here >

Mediated Moderation Models

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Table 3 regresses social bond and learning mechanisms on work intensity to examine the potential for these measures to mediate the previously observed moderation by neighborhood disadvantage. According to Muller et al. (2005), either the main effect of work intensity or interaction between the work intensity and neighborhood disadvantage must be significant at this stage for the given variable to mediate the moderation. Looking at the table, only school involvement, school attachment, and perceived peer substance use measures meet this standard, as a significant main effect of work intensity on each is present (as well the interaction between work intensity and disadvantaged neighborhood for perceive peer substance use). Thus, these are the only variables that receive further testing as potential mediators of the moderated work and binge drinking relationship.

< Table 3 About Here >

The extent to which school involvement, school attachment, and perceived peer substance use mediate the moderation by neighborhood disadvantage is tested in Table 4. Again following Muller et al. (2005), either a significant main effect of the respected mediator on binge drinking or the interaction between the mediator and neighborhood disadvantage must be present to establish mediated moderation. As evident from Table 4, only school involvement and perceived peer substance use measures meet this mark, as there are no significant relationships (neither a main effect nor interaction with neighborhood disadvantage) between school attachment and binge drinking.

That leaves school involvement and perceived peer substance use measures to potentially mediate the neighborhood disadvantage moderation in the work intensity-binge drinking relationship. Looking first at school involvement in model 1, while school involvement is significantly and negatively related to binge drinking, this measure does not explain much of the moderation by neighborhood disadvantage from Table 2. In fact, the coefficients representing the interaction are only attenuated in size by 5.7% (for the moderate work x low disadvantage interaction) and 3.5% (for the intense work x low disadvantage interaction), and both remain statistically significant.

Turning next to model 3, the results reveal that perceived peer substance use explains much of the moderation by neighborhoods of the intense work and binge drinking relationship. In particular, the

intense work x low disadvantage coefficient from Table 2 is reduced by 19.9% and is no longer statistically significant. Thus, it appears that for youth from more advantaged contexts intense work increases their own binge drinking by exposing them to substance-using peers.

< Table 4 About Here >

DISCUSSION

Using nationally representative longitudinal data, this study assessed the degree to which social structural factors (family social class and neighborhood disadvantage) moderate the relationship between adolescent work and binge drinking. Additionally, processes associated with social bond and learning theories were considered as mediators of the above moderation. Consistent with previous research (Bachman and Schulenberg 1993; McMorris and Uggen 2000; Mihalic and Elliott 1997; Steinberg and Dornbusch 1991), we found that, compared to those who do not work, adolescents who worked intense hours were more likely to binge drink. We also found evidence of moderation and mediated-moderation processes.

Results partially supported our first hypothesis, that adolescent work intensity would be more detrimental to binge drinking for adolescents from more advantaged families and neighborhoods compared to others. Although there were no significant differences by social class, the effects of moderate and intense work on binge drinking were significantly greater among those from relatively advantaged neighborhoods. That the relationships between work intensity and binge drinking are stronger among those from advantaged backgrounds is consistent with previous studies that have considered family structure as an indicator of disadvantage (Bachman et al. 2013; Rocheleau and Swisher 2012).

We sought to explain moderation by neighborhood disadvantages by drawing upon two classic criminological theories—social control and social learning. Results partially supported our second hypothesis. On the one hand, none of the social control or social learning measures mediated the moderation of neighborhood disadvantage with respect to the effect of moderate work on binge drinking. On the other hand, the perceived peer substance use social learning measure explained a substantial amount of variation in the effect of intense work on binge drinking.

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It thus appears that the effect of intense work on binge drinking is greater among those from more advantaged backgrounds because of the differential effect it has on exposure to substance-using peers. By working intensely during the school year, adolescents from advantaged neighborhoods are more likely to interact and become friends with others from similarly advantaged neighborhoods where rates of alcohol use are higher compared to others (Snedker et al. 2009). It is likely that the peer network for those working within or near more advantaged neighborhoods contains more substance-using peers to model and reinforce drinking behavior than those whose coworkers are disproportionally from disadvantaged neighborhoods. At the same time, it is also possible that it is not as much that the *exposure* to substance-using peers that differs by neighborhood disadvantage as the *influence* of substance-using peers is greater for those from more advantaged neighborhoods. This would be consistent with prior research finding that the effect of deviant peers on substance use is less for those from disadvantaged neighborhoods (McGee 1992; Snedker et al. 2009). Future research should further examine the specific processes in which deviant peer associations explain differences in the relationship between intense work and binge drinking by social disadvantage.

It is curious, however, that perceived peer substance use did not explain differences in the effect of moderate work on binge drinking. It may be that by working moderate hours, adolescents are not as invested in or able to maintain relationships with their peers at work. Similarly, adolescents who work limited hours during the school year may still maintain close relationships with school and neighborhood peers, whereas those who work intense hours may begin to lose touch with such peers. Future research should investigate other possible mechanisms that could account for varying relationship between work and adolescent substance use across neighborhoods, such as the meaning and nature of work.

Several limitations of the study should be recognized. First, because the data were based on a school-based sample it likely excludes the most disadvantaged who had dropped out of the system altogether. A second set of limitations involves measures of adolescent work that are not available in Add Health. While researchers have noted the importance of work intensity, it is also important to consider other characteristics of employment, such as the type of job, nature of tasks involved, and associated

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relationships with co-workers. A third limitation is that since the social control and social learning mechanisms are measured concurrently with binge drinking, it is possible that the intervening mechanisms do not cause changes in binge drinking, but that these variables are simply correlated with one another. Also, by relying on second-hand accounts of peer behavior, it is possible that respondents are projecting their own behaviors on their peers, or assuming their peers are behaving in a similar fashion (Aseltine 1995; Jussim and Osgood 1989). A final limitation is that the data were collected from 1994 to 1995, and there may be unknown differences in how adolescents experience work and binge drink today.

Despite these limitations, this research makes a contribution to the research on work intensity and binge drinking in adolescence by finding that perceived peer substance use accounted for differences in said relationship by neighborhood disadvantage. One of the ways in which work in adolescence is thought to be beneficial to growth and development is by fostering independence and personal responsibility (Coleman et al. 1974). Results from the current study caution, however, that too much work may foster binge-drinking behaviors for adolescents, especially those from more advantaged backgrounds who may become exposed to older, more deviant social networks and peers in the workplace than school or neighborhood-based networks.

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Table 1. Descriptive Statistics (*n* = 4,826)

Variable	Mean or Frequency	SD	Range
Binge drinking (WII)	33.67	-----	0.00 – 1.00
No work (WI)	44.67	-----	0.00 – 1.00
Moderate work (WI)	41.59	-----	0.00 – 1.00
Intense work (WI)	13.74	-----	0.00 – 1.00
Low social class (WI)	26.77	-----	0.00 – 1.00
Middle social class (WI)	45.63	-----	0.00 – 1.00
High social class (WI)	27.60	-----	0.00 – 1.00
High disadvantage (WI)	15.62	-----	0.00 – 1.00
Middle disadvantage (WI)	79.71	-----	0.00 – 1.00
Low disadvantage (WI)	4.66	-----	0.00 – 1.00
Parental involvement (WII)	0.31	0.23	0.00 – 1.00
Parental attachment (WII)	3.33	0.66	0.00 – 4.00
School involvement (WII)	1.87	0.68	0.00 – 3.00
School attachment (WII)	2.70	0.86	0.00 – 4.00
Perceived peer substance use (WII)	0.99	0.90	0.00 – 3.00
Age (WI)	16.58	0.67	16.00 – 18.00
Female (WI)	49.11	-----	0.00 – 1.00
White (WI)	51.66	-----	0.00 – 1.00
African American (WI)	19.44	-----	0.00 – 1.00
Hispanic (WI)	18.40	-----	0.00 – 1.00
Asian (WI)	8.93	-----	0.00 – 1.00
Other race (WI)	1.57	-----	0.00 – 1.00
Two biological parents (WI)	56.34	-----	0.00 – 1.00
Grade point average (WI)	2.69	0.83	0.50 – 4.00
Binge drinking (WI)	30.94	-----	0.00 – 1.00

Table 2. Generalized Hierarchical Regressions of Binge Drinking on Work Intensity, Moderation by Social Class and Neighborhood Disadvantage ($n = 4,826$)

Variable	Model 1			Model 2			Model 3		
	b	SE	Exp (b)	b	SE	Exp (b)	b	SE	Exp (b)
Individual-level Variables									
Moderate work (WI)	0.027	0.111	1.027	0.081	0.176	1.085	0.033	0.118	1.033
Intense work (WI)	0.454**	0.151	1.574	0.399	0.227	1.490	0.452**	0.156	1.572
Low social class (WI)	- 0.047	0.121	0.955	- 0.028	0.207	0.972	- 0.036	0.122	0.964
High social class (WI)	0.063	0.114	1.065	0.101	0.214	1.106	0.077	0.114	1.080
Age (WI)	0.042	0.071	1.043	0.041	0.071	1.042	0.041	0.071	1.042
Female (WI)	- 0.407***	0.093	0.666	- 0.404***	0.093	0.667	- 0.408***	0.094	0.665
African American (WI)	- 0.940***	0.168	0.391	- 0.938***	0.168	0.392	- 0.953***	0.166	0.386
Hispanic (WI)	- 0.177	0.148	0.838	- 0.177	0.148	0.838	- 0.197	0.146	0.822
Asian (WI)	- 0.623**	0.195	0.536	- 0.623***	0.193	0.537	- 0.616**	0.195	0.540
Other race (WI)	0.059	0.398	1.061	0.063	0.396	1.065	0.055	0.395	1.056
Two biological parents (WI)	0.046	0.096	1.047	0.043	0.097	1.044	0.049	0.097	1.050
Grade point average (WI)	- 0.164*	0.064	0.849	- 0.169**	0.064	0.844	- 0.166*	0.064	0.847
Prior binge drinking (WI)	2.182***	0.108	8.864	2.187***	0.109	8.910	2.196***	0.108	8.989
Neighborhood-level Variables									
High disadvantage (WI)	- 0.523**	0.178	0.593	- 0.536**	0.178	0.585	- 0.504**	0.177	0.604
Low disadvantage (WI)	0.539*	0.214	1.713	0.535*	0.215	1.708	0.446*	0.223	1.562
Cross-level Interactions									
Moderate work x Low social class	-----	-----	-----	- 0.155	0.251	0.857	-----	-----	-----
Moderate work x High social class	-----	-----	-----	- 0.067	0.265	0.935	-----	-----	-----
Intense work x Low social class	-----	-----	-----	0.260	0.372	1.297	-----	-----	-----
Intense work x High social class	-----	-----	-----	- 0.087	0.425	0.917	-----	-----	-----
Moderate work x High disadvantage	-----	-----	-----	-----	-----	-----	- 0.006	0.363	0.994
Moderate work x Low disadvantage	-----	-----	-----	-----	-----	-----	0.803*	0.361	2.231
Intense work x High disadvantage	-----	-----	-----	-----	-----	-----	- 0.253	0.445	0.776
Intense work x Low disadvantage	-----	-----	-----	-----	-----	-----	1.391**	0.529	4.018
Intercept	- 0.855***	0.057		- 0.858***	0.057		- 0.857***	0.058	
Log likelihood	- 6,788.128			- 6,788.063			- 6,783.535		

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Generalized Hierarchical Regressions of Social Bond and Learning Mechanisms on Work Intensity, Moderation by Neighborhood Disadvantage ($n = 4,826$)

Variable	Parental Involvement	Parental Attachment	School Involvement	School Attachment	Peer Substance Use
	b	b	b	b	b
Individual-level Variables					
Moderate work (WI)	0.005	- 0.045	- 0.035	- 0.044	0.119***
	(0.009)	(0.031)	(0.026)	(0.041)	(0.036)
Intense work (WI)	- 0.025	- 0.038	- 0.099*	- 0.148*	0.251***
	(0.013)	(0.043)	(0.043)	(0.057)	(0.046)
Neighborhood-level Variables					
High disadvantage (WI)	- 0.003	0.065	0.012	0.146**	0.006
	(0.014)	(0.039)	(0.045)	(0.051)	(0.059)
Low disadvantage (WI)	0.048	0.012	- 0.073	0.171*	0.180
	(0.029)	(0.066)	(0.063)	(0.075)	(0.089)
Cross-level Interactions					
Moderate work x High disadvantage	- 0.016	0.097	0.014	- 0.019	- 0.220*
	(0.020)	(0.072)	(0.065)	(0.099)	(0.091)
Moderate work x Low disadvantage	0.012	0.043	- 0.065	- 0.046	- 0.004
	(0.047)	(0.122)	(0.113)	(0.120)	(0.160)
Intense work x High disadvantage	- 0.036	- 0.006	- 0.004	0.068	- 0.287*
	(0.033)	(0.110)	(0.104)	(0.121)	(0.125)
Intense work x Low disadvantage	0.073	- 0.015	- 0.069	0.191	0.313
	(0.064)	(0.200)	(0.137)	(0.188)	(0.186)

*$p < .05$. **$p < .01$. ***$p < .001$.

Notes: Standard errors in parentheses. Models control for age, sex, race, family structure, grade point average, and social class.

Table 4. Generalized Hierarchical Regressions of Binge Drinking on Work Intensity, Mediated Moderation ($n = 4,826$)

Variable	Model 1			Model 2			Model 3		
	b	SE	Exp (*b*)	*b*	SE	Exp (*b*)	*b*	SE	Exp (*b*)
Individual-level Variables									
Moderate work (WI)	0.018	0.120	1.018	0.031	0.118	1.031	- 0.030	0.130	0.971
Intense work (WI)	0.427**	0.154	1.532	0.456**	0.156	1.578	0.316	0.164	1.372
School involvement (WII)	- 0.416***	0.073	0.660	-----	-----	-----	-----	-----	-----
School attachment (WII)	-----	-----	-----	0.005	0.058	1.005	-----	-----	-----
Peer substance use (WII)	-----	-----	-----	-----	-----	-----	0.948***	0.066	2.581
Neighborhood-level Variables									
High disadvantage (WI)	- 0.496**	0.180	0.609	- 0.503**	0.180	0.605	- 0.626***	0.182	0.535
Low disadvantage (WI)	0.411	0.222	1.508	0.430	0.220	1.537	0.269	0.236	1.309
Cross-level Interactions									
Moderate work x High disadvantage	- 0.011	0.368	0.989	- 0.019	0.361	0.981	0.270	0.404	1.310
Moderate work x Low disadvantage	0.757*	0.354	2.131	0.806*	0.358	2.238	0.865*	0.359	2.375
Intense work x High disadvantage	- 0.248	0.431	0.780	- 0.261	0.442	0.771	0.099	0.466	1.104
Intense work x Low disadvantage	1.342*	0.524	3.827	1.384**	0.529	3.990	1.114	0.661	3.045
School involvement x High disadvantage	0.137	0.202	1.147	-----	-----	-----	-----	-----	-----
School involvement x Low disadvantage	0.059	0.283	1.061	-----	-----	-----	-----	-----	-----
School attachment x High disadvantage	-----	-----	-----	- 0.151	0.147	0.860	-----	-----	-----
School attachment x Low disadvantage	-----	-----	-----	0.057	0.182	1.059	-----	-----	-----
Peer substance use x High disadvantage	-----	-----	-----	-----	-----	-----	0.093	0.165	1.097
Peer substance use x Low disadvantage	-----	-----	-----	-----	-----	-----	0.055	0.222	1.057

*$p < .05$. **$p < .01$. ***$p < .001$.

Notes: Models control for age, sex, race, family structure, grade point average, and prior binge drinking.

Figure 1. Predicted Probabilities of Binge Drinking by Categories of Work and Neighborhood Disadvantage