Social Networks, Employment, and Youth Delinquency

By

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Introduction

Employment has long been viewed as a general deterrent to criminal activity. Employment is expected to facilitate prosocial and positive attachments, increase income and resources, and reduce individuals’ free time, all of which have been theorized as important social control mechanisms (Hirchi 1969; Sampson and Laub 1993). For adolescents, however, research suggests that employment may actually decrease social control. Though some research attributes positive outcomes to adolescent employment, such as increased sense of responsibility and an attachment to positive adult role models (Hirschi 1969; Phillips and Sandstrom 1990), the plurality of research on this topic identifies negative outcomes of adolescent employment, including heightened stress, elevated drug and alcohol use, diminished school performance, and increased access to opportunities to commit delinquency in the workplace (Ruggiero, Greenberger and Steinberg 1982; Steinberg and Dornbusch 1991; Wright and Cullen 2000; though see Apel et al. 2007 for an exception). In general, research on adolescent employment and crime suggests that there is a positive and significant relationship between adolescent work and delinquency, meaning that adolescents working a greater number of hours during the school year are more likely to engage in delinquent behavior.

The inconsistency of the effect of employment on delinquency for adults and adolescents is an important criminological puzzle. Researchers suggest that association between employment and adolescent delinquency could be the result of decreased adult supervision (Osgood and Anderson 2004), increased exposure to drugs and alcohol (Steinberg and Dornbusch 1991; Steinberg and Cauffman 1995), added stress (Ruggiero, Greenberger and Steinberg 1982), and increased contact with older and potentially more delinquent coworkers outside of the school context (Steinberg and Dornbusch 1991; Ploeger 1997). Here, we focus on the possibility that that work may affect the social network structure and characteristics of adolescents and that these network differences (between employed and unemployed adolescents) may explain the work-crime relationship. Ploeger (1997), for instance, argues that employed adolescents are likely to have more contact with delinquent peers. To date, research has yet to directly evaluate the degree to which friendship patterns and involvement explain the work-crime relationship during adolescence.

In the current study, we present and test a friendship and social network explanation for the relationship between adolescent employment and delinquency. We hypothesize that the social network characteristics of employed youth vary substantially from those of unemployed youth. Specifically, we expect employed youth to spend more time with their friends, to have more friends from outside of the school environment, and to be less embedded in the school social network. We provide a partial test of the network explanation using Wave 1 of The National Longitudinal Study of Adolescent to Adult Health, which provides information regarding the friendship networks, work characteristics, and delinquent habits adolescents during their mid to late teenage years.

Literature

Research examining the relationship between adolescent employment during the school year and delinquency has not directly examined a friendship network explanation of the work-
crime relationship for adolescents. A friendship network explanation suggests that employed adolescents are likely to be friends with different types of people than unemployed adolescents. In particular, the limited and entry-level-specific work environment that adolescents have access to may expose adolescents to more delinquent peers, and engaging in work may weaken the bonding to the prosocial school environment. From the school integration standpoint, less school involvement and attachment can generally be conducive to participation in delinquency (Kreager 2004; Houghton et al. 2008) and increased embeddedness in the work environment in adolescence can be equally as detrimental (Wright, Cullen and Williams 2002).

This research is important as a substantial number of adolescents work during the school year (Marsh and Kleitman 2005; Mortimer 2010). Data from the Current Population Survey suggests that 20 to 30% of youth have worked during the school year since the 1970s, suggesting that adolescent employment during the school year is becoming normative (Herman 2000). Indeed, the prevalence of work among adolescents has spawned a large body of research, as researchers have investigated outcomes associated with adolescent employment in samples of high school students since as early as 1975, with the start of the Monitoring the Future Project (Herzog, Bachman and Johnston 1979; Herzog, Bachman and Johnston 1983; Bachman, Bare and Frankie 1986). These earlier studies generally focused on describing the general work habits of adolescents, including the type of work they were likely to do, the amount of hours worked per week, and the quality of the work conducted. Other related studies have even examined the nature and quality of the work performed and its potential effects on the adolescent employees – i.e. whether the employment opportunities are internships, apprenticeships, or menial jobs that provide little to no sense of purpose or sense of accomplishment (Greenberger & Steinberg 1986; Barling, Rogers & Kelloway 2006). In relation to the work and delinquency relationship, much of the prior research has focused narrowly on demonstrating that work is a risk factor for delinquency, with little research examining why work might increase the risk of delinquency for adolescents. (Marsh 1991; Steinberg and Dornbusch 1991; Steinberg and Cauffman 1995; Ploeger 1997; see Gottfredson and Hirschi 1990; Wright and Cullen 2000, Paternoster, Bushway and Apel 2003, Apel et al 2007, and Monahan, Lee, & Steinberg 2011 for exceptions).

Historically, researchers seemed to expect work to have a positive effect on adolescents, and this idea was corroborated by studies suggesting that employment provided beneficial learning opportunities for adolescents and facilitated a smooth transition to later integration into the adult workforce (Cloward and Ohlin 1960; Farkas, Smith and Stromsdorfer 1983; Green 1990; Phillips & Sandstrom 1990; Mortimer, et al. 1994; Shanahan, Elder, Burchinal & Conger 1996; Shanahan, Mortimer and Kruger 2002; Mortimer, Harley and Staff 2002). Indeed, work was expected to be a positive factor in the lives of adolescents, as a wide body of research indicates that work is a positive factor for adults, deterring many deviant and criminal behaviors that may stem from unemployment, lack of money, or idle time (Becker 1968; Sullivan 1989; Allan and Steffensmeier 1989; Sampson & Laub 1993). Similarly, society, parents (Phillips and Standstrom, 1990; Runyan et al., 2008) and adolescents (Mortimer, 2010) in particular, largely view teenage employment as a positive and supportive of adolescent employment. In fact, recent research still partially supports this idea that moderate amounts of work is positive for adolescents, as the life skills and other characteristics developed from balancing non-intensive work and school responsibilities have been shown to be more conducive to these adolescents’
further educational attainment following high school (Staff and Mortimer 2007). The research pool on this topic generally only pinpoints positive (or non-negative) results from adolescent employment if the adolescents work limited hours (Bachman and Schulenberg 1993; Steinberg and Cauffman 1995), maintain high academic standing (Wright & Cullen 2000), have plans to attend college (Entwisle, Alexander and Olson 2000; Weller et al. 2003; Apel et al. 2007; Lee & Staff 2007), and have ample time for extracurricular activities (Mortimer 2010).

In terms of delinquency and antisocial behavior, the literature consistently indicates that employment is a general risk factor for most adolescents, specifically in terms of the work quantity. For example, Greenberger and Steinberg (1986) found that working increasingly more hours during the school year was negatively associated with school performance and investment in schoolwork and related activities. Steinberg and Dornbusch (1991) found that working long hours was negatively associated with school success. Similarly, Marsh (1991) found that employment negatively affected school attendance, the likelihood of going to college, test scores, future employment aspirations and staying out of trouble.

Other research links employment more directly with delinquency and crime. Bachman and Schulenberg (1993), for instance, found that work intensity was positively related to a variety of undesirable behaviors in adolescence, from drug and alcohol use to theft and so on, but suggested that it may be due, in part, to precocious self-selection into the work environment and simultaneous dissociation with school, as much as the type and quantity of the work performed. Other studies, including Schoenhals, Tienda and Schneider (1998), McMorris and Uggen (2000), Bachman et al. 2003 and 2008, and Mortimer (2003) similarly describe a positive relationship between high-intensity work and problem behaviors in high school There is a near consensus among researchers that the amount of hours worked each week and, the type of work, are significantly related to youth delinquency (for exceptions to the causal and solely negative predictions regarding employment and delinquency, see Paternoster et al. 2003 and Newman 1999). More specifically, factors such as the more hours worked per week, the more menial the employment, and the more predisposed the adolescent already is to commit delinquent acts are generally more predictive of adolescent delinquency than the simple factor of work itself (Greenberger and Steinberg 1986; Gibson and Wright 2001; Weller et al. 2003).

Friendship Network Explanation

One potential explanation for the relationship between work and delinquency is that working affects the friendship network of adolescents. As adolescents are extremely likely to work in entry-level positions in retail and food service companies that work with school hours (Greenberger and Steinberg 1986; Tilly 1995), it is likely youth spend substantial amounts of time socializing with other youth and young adults while they work and outside of the workplace (Greenberger Steinberg 1981; Besen 2006). Moreover, youth employment may provide adolescents with additional resources to engage in social activities with friends (Osgood et al 1996; Safron, Schulenberg and Bachman 2001). As such, it is likely that employed adolescents spend more time with their friends and potentially more time with young adults than adolescents who are not employed. In fact, research shows that employed adolescents spend more time in unstructured socializing activities than their unemployed counterparts and also have more money for this type of socializing due to their income (Osgood 1999).
The frequency and duration of time that adolescents spend with friendship groups in unstructured settings have been shown to have an influential effect on these adolescents’ subsequent behaviors (Agnew 1991; Akers and Jensen 2006). The amount of time that adolescents spend with friends is a key factor which differentiates adolescent friendship styles (Giordano et al. 1986), and thus may be related to delinquency patterns. Indeed, some research shows that time spent with friends is a risk factor for delinquency for youth (Flannery, Williams and Vazsonyi, 1999; Haynie 2001; Osgood and Anderson 2004). Compared to adult crime, youth crime often has a co-offending element (Warr 2002), further supporting the notion that time spent with friends creates additional opportunities for youth engage in delinquency. Given that adolescents who work are likely to spend more time with their peers, it may be that friendship involvement is the key mediating factor which links work and delinquency for youth.

Beyond the raw amount of time spent with peers, having delinquent peers is widely viewed as one of the strongest predictors of criminality (Haynie 2001, Akers and Jensen 2006; McGloin and O’Neill Shermer 2009; Lilly, Cullen and Ball 2015). Though there is debate about the specific mechanism by which delinquent peers are linked to delinquency (Glueck and Glueck 1950; Warr 2002; Akers and Jensen 2006), a wide body of research shows a significant link between delinquent peers and delinquency (Warr and Stafford 1991; Flannery, Williams and Vazsonyi 1999; Haynie 2001; Haynie 2002). In terms of adolescent work and crime, it is possible that employment not only increases the amount of time that adolescents spend with their friends, but also increases the likelihood that adolescents have delinquent friends. Researchers suggest that the common places of employment that high school students select, such as the food service and retail sectors, are ripe with opportunity to meet delinquent peers and coworkers who encourage delinquent behavior (Ruggiero, Greenberger and Steinberg 1982; Wright and Cullen 2000). Even if it is the case that social learning outside of the prosocial school context is not the cause of delinquency, a previously delinquent adolescent’s self-selection into a deviant workplace (via Gottfredson and Hirschi’s 1990 and the Gluecks’ 1950 ‘birds of a feather flock together’ argument) could still continue to heighten his or her delinquent activity and involvement (Akers 1998; Warr 2002; Lilly, Cullen and Ball 2015) through social learning cues (Akers 1991).

Lastly, employment may also reduce an adolescent’s integration into the school setting. As an adolescent spends more time at work and as their social network contains a greater proportion of people from work (including youth from other schools and young adults), they may spend less time with friends from school and less time on school-related activities. In other words, even as they spend more time with friends, this increased time with friends may be with a confined or restricted friendship pool, as they become less involved in school-based social networks. Research suggests that adolescents working during the school year devote less time to school work and related school activities (Marsh 1991; Bills, Helms and Ozcan 1995). As such, employed adolescents may experience a sense of social isolation and/or a lack of belonging in the entire school environment. Studies indicate that social isolation from the school setting -- whether it is related to school performance, involvement in extracurricular activities, educational goals, or school friendships -- is a strong correlate of delinquency (Sampson and Laub 1993; Kreager 2004). Thus, as working adolescents become less involved in school life, they may have less attachment to and be subject to less social control from the broader prosocial school network
that has been shown to have a deterring effect on delinquency (Staff et al. 2010). As research links adolescent social isolation from peers with criminality and delinquency (Parker and Asher 1987; Kreager 2004; Houghton, Carroll, Tan and Hopkins 2008) and links increased adolescent embeddedness in work roles with negative behavioral consequences (Wright, Cullen and Williams 2002), social network isolation also appears to be an important factor to consider in the employment-delinquency relationship.

Research has yet to directly examine the link between adolescent social network embeddedness and delinquency, though a body of research does link social network characteristics to delinquency for adolescents. Haynie (2001) shows, for instance, that network density and centrality condition the effect of delinquent peers. In this research, network density, or how well-connected a respondent was to his peers, is positively associated with increased levels of delinquent involvement when the network consisted of a large amount of delinquent friends. Network centrality was similarly associated with delinquency in Haynie’s (2001) research, as the more central or popular a respondent became in the network, the more delinquent the respondent generally became. In addition to network characteristics, friend involvement, or the amount of time an adolescent spends with friends, is also an important influence on delinquency. Studies like Haynie and Osgood (2005) and McGloin and O’Neill Shermer (2009) have uncovered that the amount of time spent with friends is positively associated with delinquent involvement.

In summary, evidence suggests that employment is a risk factor for delinquency for adolescents. Here, we suggest that one mechanism through which employment might be related to delinquency is through its effects on adolescent friendship involvement and patterns. Specifically, we offer the following hypotheses of which our research will address:

Hypothesis 1: Adolescents who work more hours are more likely to engage in crime and delinquency.
Hypothesis 2: Adolescents who work more hours spend more time with friends.
Hypothesis 3: Adolescents who work more hours have more delinquent friends.
Hypothesis 4: Adolescents who work more hours are less integrated into the school network.
Hypothesis 5: Time spent with friends, delinquent peers, and school social network embeddedness mediates the work-crime relationship.

**Research Design**

**Data**

Data for the current research are drawn from Wave I of The National Longitudinal Study of Adolescent to Adult Health (Add Health) restricted-use database, which was developed and distributed by the University of North Carolina’s Carolina Population Center. Applying for the restricted-use data required a lengthy application, Third-Party Access to Existing Data IRB approval, a detailed description of the research question before seeing any of the data, and an explanation of why each dataset applied for was necessary in order to complete the proposed research. The Add Health data contains a plethora of information regarding the health, social network composition, psychological well-being, delinquency, education, and employment of
approximately 15,000 adolescent students attending over 100 middle schools and high schools, with Wave I of the data collection beginning in the years of 1994 to 1995. However, because of unequal sampling practices within a certain amount of the schools surveyed, our final research sample size for the current research was 1,437 high school student respondents, encompassing only the 12 schools in which every student present was asked to fill out the survey so that a complete school friendship network picture could be generated.

The Add Health Wave I data utilized for this research were the In Home Interview files, Parent Interview files, In School Interview files, and Network files. The Network files contained various information relevant to the current research in regards to the friendship networks of the respondents, the density of the friendship network, how central the respondents were in the network, and enabled a calculation of how similar respondents were to their friends in terms of network homophily. The information provided for the Wave I sampling in the In Home Interview and In School Interview files provided crucial details for the research regarding the self-reported amount of hours adolescents worked during the school year (measured as hours worked per week), the self-reported amount of different delinquent acts the adolescent had participated in in the year preceding the survey (n=14), the self-reported strength of the friend involvement of the adolescents (how often respondents reported hanging out with their friends per week), and the number of friends outside of the school that the adolescents nominated. The friendship nomination data enabled the construction of the percentage of delinquent friends for each respondent, as well as the calculation of the percentage of outside friends (friends not attending their school) for each respondent (if any). However, two drawbacks to the friendship nominations in Add Health were that the respondent was not given space to explain where his or her outside friends were from, and the respondent was limited to identifying a maximum of ten friends, with five being male and five being female.

After the request for the restricted-use Add Health data was approved and the data were granted, we were required to furnish proof of having purchased an encrypted hard drive to store the data on so as to prevent the restricted-use data from getting into the wrong hands. The restricted-use portion of the dataset we were granted provides the unique identifier participant codes, which enabled the construction of the friendship networks of the participants, a defining element of the current research project that quantified our independent variable. However, these identifier codes could potentially be used to deductively identify the original participants in the Add Health research, which is why we required to take such cautious measures with the data. Once the data was received from Add Health, the data was converted from use in the program, Pajek, to the program, UCINET. The network structure files that contained the unique identifiers of the friends each respondent nominated within his or her school were merged with our constructed Excel attribute files containing individual-level characteristics of the nominator and nominees. Using these merged files, we calculated a network homophily measure of peer delinquency in UCINET. This measure indicated the percentage of a respondent’s network who shared the same delinquency status as the respondent. In other words, if a respondent identified as delinquent, the homophily measure (which ranges from 0 to 1) indicates the percentage of the respondents’ ego network which also responded as delinquent. We used this information to calculate the percentage of a respondent’s network consisting of delinquent friends. Previous researchers have done this, including Haynie (2001), Haynie and Osgood (2005), and McGloin
and O’Neill Shermer (2009), and have revealed that there is, in fact, a connection between the social network characteristics of a respondent and the respondent’s characteristics (in exhibiting delinquent or non-delinquent behaviors). The Add Health network data also contained information regarding the density of the friendship network and the respondent’s centrality in the network. These constructed variables were used to see whether more dense (or more directly connected or tied) networks or network centrality (social popularity) mattered in the delinquency equation.

In order to visualize the relationship between employment and the peer-variables of friend involvement, peer delinquency, outside friends, network centrality, and network density, we constructed and have provided in Table 2 a one-way ANOVA to gauge and present the different effects of working in small quantities, working in larger quantities, and not working at all on these peer-related variables. Next, in order to measure the effects of friendship networks on delinquency, we moved the network measures, as well as our dependent variable, key independent variable and mediating/control variables, into STATA to complete the regression analyses. Two analyses were then conducted and completed, the first only containing the dependent variable (delinquency), the key independent variable (hours worked per week), and the control variables (self-control, parental income, age, race/ethnicity, and sex). A second analysis was completed with the same variables as before, with the exception of the addition of this new set of peer-related social network variables to test the strength of the relationship between employment and delinquency: friend involvement, percent delinquent friends, Bonacich network centrality, network density, and outside friend nominations.

**Dependent Variable**

The delinquency index variables used in our research contained 14 types of delinquency, together comprising our dependent variable. Included in these variables were vandalism, graffiti, major and minor theft, major and minor fighting, group fighting, shoplifting, burglary, robbery, drug dealing, injuring someone with a weapon, threatening someone with a weapon, and joyriding. We constructed an index using the delinquency variables, where delinquency was measured on a scale of 0 to 14, with 14 being most delinquent on the scale (having participated at least once in all of the delinquent acts previously listed in the preceding year) and 0 representing no participation in any of the previously listed delinquent acts. The delinquency index was modeled after Haynie’s (2002) and Haynie and Osgood’s (2005) Add Health delinquency indices. Appendix B contains the delinquent acts that the respondents were anonymously asked to indicate if and how often they had participated in on the questionnaire.

**Key Independent Variable**

The key independent variable in our research was self-reported employment hours during the school year. Respondents were asked whether or not they were employed during the school year and were then asked to approximate how many hours they worked per week during the school year. The exact questions given in the interview were “In the past 4 weeks, did you work – for pay – for anyone outside your home?” and “How many hours do you spend working for pay in a typical non-summer week?” We combined these two variables into a single question measuring the number of hours students work during non-summer weeks, with students who did
not work being recoded as working 0 hours. There was no distinction made between legal and illegal employment or formal or informal employment in the questionnaire given to the students, giving all students an opportunity to claim the employment available to them at a young age.

Mediating Variables
The mediating variables were the percentage of delinquent friends in the respondent’s network (constructed from network variables using the answers from the delinquency index scale questions and from the network IDs of the students that the respondents nominated), the number of outside friendship nominations the respondent made (pre-constructed variable), the pre-constructed network density and centrality measures of each respondent, and the amount of time the respondent reported spending with friends (constructed from the response: how often the respondent hung out with friends in days per week). Research has shown that the amount of time spent away from school activities affects the bonding that the student has with the prosocial school environment, as those students who participate less in school activities are likely to feel less attachment to the school and likely its values (Staff et al. 2010). Wright, Cullen and Williams (2002), for example, found that employed adolescents who were embedded in their work roles exhibited problem behaviors, perhaps because they were no longer attached to their student-role, school, and classmates as much as they were their workplace. Less attachment to schoolmates has been found to be predictive of delinquency when combined with problematic peer encounters (Kreager 2004), which is why these peer-related variables were examined in the current research.

We propose that students who are employed are less integrated and embedded in the school social network (via network centrality and density) because of the time they spend at their workplace (and thus away from school and extracurricular activities). Time spent with friends (especially in relation to outside of school friends) is also proposed to be important, as this could have the same negative effect on the attachment of the student to the school environment and the prosocial influence that accompanies it. An important variable to consider with friend involvement is the proportion of delinquent friends in the respondent’s friendship network. As mentioned before, there is a broad research base that has formulated and tested the theory that having delinquent friends very likely signifies or predicts one’s own delinquency, as well (Warr and Stafford 1991; Warr 1998; Haynie 2001; Haynie 2002; Akers and Jensen 2006). By examining all of these peer-related variables in relation to adolescent employment and delinquency, or research will be a relatively new and important addition to the previous research pool.

Control Variables
The key control variables in the research were largely demographic, with the exception of a self-control index. Age, race/ethnicity (white, black, Hispanic, Asian, mixed race), sex, and parental income (the income per year) were examined. In addition to an age-crime curve (where younger adolescents are more likely to commit crimes than older adults) (Hirschi and Gottfredson 1983) and a large gender gap in relation to drastically few incidences of female delinquency compared to males (Giordano and Cernkovich 1987), some research has shown that there is a discrepancy between racial and ethnic minorities and whites in terms of delinquency,
prompting us to attempt to account for the differences in our research. Family socioeconomic status (as measured by parental income) is also an important factor to take into account in our research, as it has been shown to indicate a likelihood of adolescents being associated with delinquent behaviors (National Research Council 1995), as well as a likely need for the respondents to engage in early adolescent employment.

**Table 1: Descriptive Statistics**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delinquency Index</td>
<td>1.876</td>
<td>2.493</td>
<td>0</td>
<td>14</td>
<td>Combination of 14 different variables measuring delinquency, $\alpha = 0.816$</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>7.284</td>
<td>10.152</td>
<td>0</td>
<td>60</td>
<td>Self-reported amount of hours worked per week during school year</td>
</tr>
<tr>
<td><strong>Peer/Network Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friend Involvement</td>
<td>2.010</td>
<td>0.955</td>
<td>0</td>
<td>3</td>
<td>Amount of time spent with friends outside of school in days per week</td>
</tr>
<tr>
<td>% Delinquent Friends</td>
<td>0.587</td>
<td>0.293</td>
<td>0</td>
<td>1</td>
<td>Percentage of delinquent friends nominated</td>
</tr>
<tr>
<td>Outside Nominations</td>
<td>1.232</td>
<td>1.951</td>
<td>0</td>
<td>10</td>
<td>Number of friendship nominations sent to non-students</td>
</tr>
<tr>
<td>Network Centrality</td>
<td>0.871</td>
<td>0.612</td>
<td>0</td>
<td>3.683</td>
<td>Eigenvalue based centrality, which calculates ego’s centrality as a function of ego and alters level of centrality</td>
</tr>
<tr>
<td>Network Density</td>
<td>0.322</td>
<td>0.150</td>
<td>0.06</td>
<td>1</td>
<td>Percentage of all possible ties between friends actually present</td>
</tr>
<tr>
<td><strong>Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental Income</td>
<td>44.02227</td>
<td>28.4246</td>
<td>0</td>
<td>250</td>
<td>In thousands of dollars</td>
</tr>
<tr>
<td>Age</td>
<td>15.03549</td>
<td>1.402641</td>
<td>12</td>
<td>19</td>
<td>In years</td>
</tr>
<tr>
<td>Self-Control</td>
<td>45.89422</td>
<td>7.654351</td>
<td>23</td>
<td>84</td>
<td>23 item index, $\alpha = 0.693$</td>
</tr>
<tr>
<td>Hispanic</td>
<td>.151009</td>
<td>.3581823</td>
<td>0</td>
<td>1</td>
<td>Dummy variable</td>
</tr>
<tr>
<td>Mixed Race</td>
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<td>.2436338</td>
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<td>1</td>
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<tr>
<td>Asian</td>
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<td>.2908834</td>
<td>0</td>
<td>1</td>
<td>Dummy variable</td>
</tr>
<tr>
<td>Black</td>
<td>.1231733</td>
<td>.3287504</td>
<td>0</td>
<td>1</td>
<td>Dummy variable</td>
</tr>
</tbody>
</table>
Self-control was also examined as a control variable in the present research, as it has been well-documented that delinquency and self-control levels are negatively related to each other (as self-control levels decrease, delinquency tends to increase) (Gottfredson and Hirschi 1990; Lilly, Cullen, and Ball 1995). The self-control index used in our research was modeled after Beaver et al.’s (2009) research using the Add Health data to examine self-control among males in the criminal justice system. Our self-control index was constructed of 23 questions regarding the adolescent’s and parent’s opinions of the adolescent’s patience, dedication, responsibility level, use of logic, and rationality in everyday life situations which were combined to provide a wide survey of the general self-control level of the adolescent (see appendix A for full index questions and items they were measuring).

**Descriptive Statistics**

As can be seen in the descriptive statistics in Table 1, the mean delinquency measure self-reported by the adolescents was roughly 1.8, meaning that average students generally committed less than two different types of delinquent behaviors or offenses in the past year that they were surveyed. The time spent with friends reported by adolescents was roughly 2, meaning the average student hung out with his or her friends 3 or 4 times per week (as coded by the Add Health questionnaire). The average hours spent working per week was roughly 7, with some of the most hours logged being 60 hours per week. The average percentage of delinquent friends reported was 0.58%, meaning a little more than half of the average respondent’s friends report that they engaged in some form of delinquency. The mean of the outside friendship nominations was around 1.2, meaning that the majority of most adolescents’ friends were from within the school, since they were allowed to nominate up to ten friends.

**Results**

**Friendship Characteristics of Differently-Employed Adolescents**

First, we examine the degree to which work is related to peer-network variables. Table 2 shows the results of a series of one-way ANOVAs, where the peer variables (amount of time spent with friends, percentage of friends who engage in some form of delinquency, non-school friends, network density, and network centrality) are the dependent variables and the work is the independent factor. Here, we separate work into three categories: did not work, worked less than 18 hours, worked more than 18 hours. We selected 18 hours as the dividing point for worked a small amount and a large amount, as the Fair Labor Standard Act limits 14 and 15 year olds to 18 hours of work during a school week. Table 2 shows that adolescents who work many hours per week are more likely to have more friends from outside of the school network, are more likely to have less dense ego networks, to be less centrally located within the school network, and are more likely to report being more involved with their friends than both unemployed adolescents and adolescents who work only a small amount of hours. These findings address our hypotheses that adolescents who work are more likely to be more involved with their friends, adolescents who work are more likely to be less embedded in the school social network, and adolescents who work are more likely to have friends from outside of the school network.
Interestingly, Table 2 shows that adolescents who work a small amount of hours (n<18) are more likely to have higher levels of network centrality than both those adolescents who log large amounts (n>18) and no amount of hours on the job per week. This may occur because employment gives low-intensity-employed students a certain status among their friends and a certain reputation at their school but yet does not take them away from their school environment so much so as to remove its prosocial influence (as it may for high-intensity–employed students). In fact, as noted by (Mortimer et al. 2003), small to moderate amounts of employment may not be as deleterious on delinquency and school achievement as thought to be regarding intense amounts of employment or no employment whatsoever. Working small hours during the week may allow the adolescents to have one foot in both worlds: the world of work and the world of high school, enabling them to both participate in extracurricular activities and have time for homework and test the waters working for and with adults at their place of employment.

Additionally, the results from Table 2 show that unemployed adolescents are more likely to have slightly more non-school friends than adolescents working a small amount of hours per week, but still less than intensely-employed adolescents. This could signify that there is not such a large difference in friendship characteristics between unemployed and employed adolescents only working a small amount of hours per week. However, intensely-employed adolescents (n>18) vary significantly from unemployed adolescents in most of these categories, suggesting that they are not subjected to the same general social forces as the unemployed adolescents.

Table 2: One Way ANOVA

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not Working</th>
<th>Working Small Amount of Hours</th>
<th>Working many hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(&lt;19)</td>
<td>(&gt;19)</td>
</tr>
<tr>
<td>Friend Involvement*</td>
<td>1.93</td>
<td>1.99</td>
<td>2.11</td>
</tr>
<tr>
<td>Peer Delinquency</td>
<td>0.59</td>
<td>0.58</td>
<td>0.59</td>
</tr>
<tr>
<td>Non-School Friends*</td>
<td>1.37</td>
<td>1.27</td>
<td>1.63</td>
</tr>
<tr>
<td>Network Density*</td>
<td>0.33</td>
<td>0.32</td>
<td>0.30</td>
</tr>
<tr>
<td>Network Centrality*</td>
<td>0.76</td>
<td>0.86</td>
<td>0.72</td>
</tr>
</tbody>
</table>

* p < 0.05

Employment, Friends and Delinquency

Table 3 presents the results from a series of negative binomial regression models, where the dependent variable is the delinquency index. As can be seen in Model 1 of Table 3, work hours during the school year are significantly related to delinquency in adolescence. The relationship is positive, showing that when work hours per week increase, adolescents’ self-reported delinquency also slightly increases. Among the other significant variables are race, sex and self-control. Black, Hispanic and Asian adolescents in this sample are more likely to be involved in delinquent activities than their white counterparts, and females are less likely to be involved in delinquent activities than males. Self-control is also positively related to delinquency, meaning that as our self-control measure increases (the respondents exhibit more incidences of low self-control) the respondents’ self-reported delinquency also slightly increases.
In Model 2 of Table 3, the relationship between friendship networks and delinquency was tested. The same variables in Model 1 were included, with the addition of the peer-variables of friend involvement, percent delinquent friends, network centrality, network density, and number of outside friends into the equation. In Model 2, work hours are no longer a statistically significant predictor of delinquency, indicating that peer and social network variables seem to mediate the relationship between work and crime.

Each of the peer/network variables is statistically significantly related to delinquency. There is a positive relationship between friend involvement, percent delinquent friends, number of outside friends and delinquency, meaning that these categories similarly increase or decrease in incidence or occurrence together. This provides support for our hypotheses that employed adolescents have more delinquent friends, hang out with their friends more often, and have more friends from outside the school social network. Network density and centrality decrease as delinquency increases, offering support for our hypothesis that employed adolescents would suffer from less social network embeddedness in the school setting. These peer-related variables’ mediation of employment’s significance, combined with the decrease in network density and centrality of employed adolescents, suggest that socialization with delinquent and non-school friends may contribute to an adolescent’s dis-embeddedness from the social network and may, in turn, contribute to an adolescent’s delinquency in this manner.

Lastly, the control variables in Model 2 demonstrate a similar pattern (in terms of direction and significance) as Model 1. Race/ethnic and sex factors still significantly matter in roughly the same manner as Model 1, with the exception of the Asian category that became non-significant. In addition, age is statistically significant in Model 2, despite not quite reaching the threshold for significance in Model 1.

Table 3: Negative Binomial Regression with Delinquency as the Dependent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Hours</td>
<td>0.007*</td>
<td>1.007</td>
<td>0.004</td>
<td>1.004</td>
</tr>
<tr>
<td>Age</td>
<td>-0.038</td>
<td>0.963</td>
<td>-0.079*</td>
<td>0.924</td>
</tr>
<tr>
<td>Black</td>
<td>0.343**</td>
<td>1.409</td>
<td>0.339*</td>
<td>1.404</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.424**</td>
<td>1.528</td>
<td>0.403**</td>
<td>1.496</td>
</tr>
<tr>
<td>Asian</td>
<td>0.262*</td>
<td>1.300</td>
<td>0.246</td>
<td>1.279</td>
</tr>
<tr>
<td>Mixed Race</td>
<td>0.156</td>
<td>1.169</td>
<td>0.130</td>
<td>1.139</td>
</tr>
<tr>
<td>Female</td>
<td>-0.593**</td>
<td>0.553</td>
<td>-0.621**</td>
<td>0.537</td>
</tr>
<tr>
<td>Parental Income</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
</tr>
<tr>
<td>Self-Control</td>
<td>0.056**</td>
<td>1.058</td>
<td>0.054**</td>
<td>1.055</td>
</tr>
<tr>
<td>Friend Involvement</td>
<td>--</td>
<td>0.180**</td>
<td>1.197</td>
<td></td>
</tr>
<tr>
<td>% Delinquent Friends</td>
<td>--</td>
<td>0.004**</td>
<td>1.004</td>
<td></td>
</tr>
<tr>
<td>Network Centrality</td>
<td>--</td>
<td>-0.129*</td>
<td>0.879</td>
<td></td>
</tr>
<tr>
<td>Friendship Network Density</td>
<td>--</td>
<td>-1.11**</td>
<td>0.330</td>
<td></td>
</tr>
<tr>
<td>Outside Friends</td>
<td>--</td>
<td>0.053**</td>
<td>1.054</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.38*</td>
<td></td>
<td>-1.11*</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01
Conclusion

Consistent with prior research, in Model 1 (Table 3) of our regression analysis, we found that work is a significant predictor of delinquency for adolescents. However, after adding the peer-related social network variables in Model 2 (Table 3) of the regression, we found support for a social network explanation of this relationship, as peer-variables appear to significantly mediate the relationship between work and delinquency, making work statistically non-significant.

More specifically, our research leads to the conclusion that it is not solely adolescent employment that causes delinquency but a combination of peer-variables and friendship network characteristics that influence an adolescent’s delinquency. As seen in the regression results in Table 3, these peer-variables are statistically significant predictors of delinquency. The inclusion of these peer-variables in Model 2 reduced the coefficient for the work variable to non-significance, meaning that once friendship network characteristics (amount of time spent with friends, number of outside friends, network density, network centrality and percent delinquent friends) are accounted for in the analysis, work is no longer a factor influencing adolescent delinquent involvement. This is an important finding, as much previous research has documented the deleterious effects of employment on adolescents’ delinquency. The characteristics of friendship networks are, in our research, more significant determinants of delinquency than employment is for adolescents. The significance of the five peer-related social network variables in our research (and the non-significance of employment) lend support to the socialization (social learning) and self-selection theories of social research which hold that adolescents who already have delinquent propensity choose to work and choose to associate with delinquent peers, and adolescents who are exposed to delinquent peers generally become delinquent themselves. Our social network research on the topic of adolescent employment and delinquency adds to the newly emerging research base challenging one-way causal work-and-delinquency-related studies.

Limitations, Implications & Future Research

The results of this research corroborate with a changing body of more recently-emerging research suggesting that employment during high school does not necessarily cause delinquency, but that the friendship networks that employed and unemployed adolescents hold may have key differences that may contribute to adolescents’ delinquent or non-delinquent behaviors. At best, our results suggest that if work does cause delinquency, it is indirectly, by way of changing the social network characteristics of adolescents. These key differences may be the employed or unemployed adolescents’ friendship network centrality, friendship network density, extent of friend involvement, type of friends (from within the school setting or without) or percent of delinquent (or non-delinquent) friends, or they may be due to entirely different preexisting social and/or psychological differences between employed and unemployed adolescents that motivate employed adolescents to self-select into a working role (see self-selection and precocious development theories for further and more in-depth explanations: Bachman and Schulenberg 1993; Staff et al. 2010). Although the socialization and self-selection standpoints in regards to delinquency have been long debated in regards to delinquent effects, there is a growing
consensus among recent research opposing the commonly held idea of the causal effect of work on delinquency. In fact, the interpretation of the present research results could yield support for either explanation of socialization or self-selection or a combination of the two forces contributing to delinquent behavior.

Unfortunately, though the Add Health data are useful for examining social network characteristics and delinquency, they do not possess all of the measures needed to provide a full examination of the work-crime relationship. For instance, Add Health data do not include information on the type of job worked by adolescents, thus we are unable to account for the potential effects of the type or quality of work. In terms of network variables, we are only able to identify the number of outside nominations made by a peer. We are unable to determine how many of these outside nominations are to friends from or met at work, nor do we have any measure of the delinquency of these outside nominations.

In the relationship between adolescent employment and delinquency, we were originally interested in finding evidence suggesting that the individuals employed adolescents come into contact with at the workplace influence their delinquency. There is no definitive way of finding an answer to this with the Add Health data that was used, as the questions asked regarding outside friendship nominations did not ask the respondent to indicate where he or she met the outside friends that were nominated. Additionally, the type of work the respondents participated in also was not indicated in the Add Health data. There was no distinction made between informal and formal (or legal and illegal) work types and no information given regarding the quality and type of jobs that were performed by the adolescents, which has been documented in research to have an effect on job satisfaction and workplace crime and delinquency (Greenberger and Steinberg 1986; Besen 2006).

As mentioned before, other research has suggested that the work-crime relationship in adolescence is spurious and not causal – that the same factors (preexisting differences in the traits, attitudes, and characteristics of the adolescents themselves) which influence delinquency in adolescence also influence the likelihood that adolescents seek out and obtain employment, as well as the friends that these adolescents choose to associate with. Our research accounted for socioeconomic variables in the form of parent income, as well as self-control levels in our 23 question index; however, there may have been more variables that could have been examined in order to determine if any of these individual-level characteristic or trait differences that are attributed to the self-selection and precocious development theories may have had a significant relationship with work and delinquency. Future research should examine more of these preexisting factors to test the aforementioned theories and to evaluate the strength of the relationship between friendship network characteristics and delinquency. Additionally, future research should examine both Wave I and Wave II of the Add Health data in order to more accurately discern whether there is a clear causation between future delinquency and prior adolescent social network characteristics of centrality, density, time spent with friends or whether the peer effect diminishes over time.
References


APPENDICES:

Appendix A: Self-Control Measure
The constructed self-control index measured 23 variables from the Parent Interview files and the In Home Interview files, asking the questions below to judge:

- how the parent believes their child’s life is going
- how well the parent gets along with their child
- how well the parent feels like they can trust their child
- whether or not the parent believes their child has a bad temper
- how much the adolescent believes he/she argues
- how hard the adolescent believes that he/she works to get what he/she wants
- on how many occasions the adolescent is sad
- how often the adolescent criticizes other people
- how often the adolescent avoids dealing with life problems
- whether or not difficult problems make the adolescent upset
- how often the adolescent analyzes what went right and wrong in solving a problem
- how well the adolescent likes him/herself
- whether or not the adolescent feels like he is doing everything “just right”
- whether or not the adolescent feels socially accepted
- whether or not the adolescent has trouble getting along with teachers
- whether or not the adolescent has difficulty paying attention in school
- whether or not the adolescent has trouble keeping his mind focused
- whether or not the adolescent has trouble finishing homework
- whether or not the adolescent has trouble getting along with other students
- how often the adolescent goes with his “gut feeling” instead of thinking of consequences
- how often the adolescent gathers as much information as possible about a problem
- how often the adolescent thinks of alternative approaches to solutions of a problem
- how often the adolescent makes decisions by comparing alternatives

*A high value on the self-control index scale signifies that the respondent has less self-control in general than those with a low value.

Add Health Self-Control Questions

1. All things considered, how is your child’s life going?
2. You get along well with your child.
3. You can trust your child.
4. Does your child have a bad temper?
5. You never argue with anyone.
6. When you get what you want, it’s usually because you worked hard for it.
7. You never get sad.
8. You never criticize other people.
9. You usually go out of your way to avoid having to deal with problems in
10. Difficult problems make you very upset.
11. When making decisions, you usually go with your “gut feeling” without thinking too much about the consequences of each alternative.
12. When you have a problem to solve, one of the first things you do is get as many facts about the problem as possible.
13. When attempting to find a solution to a problem, you usually try to think of as many different ways to approach the problem as possible.
14. When making decisions, you generally use a systematic method for judging and comparing alternatives.
15. After carrying out a solution to a problem, you usually try to analyze what went right and what went wrong.
16. You like yourself just the way you are.
17. You feel like you are doing everything just about right.
18. You feel socially accepted.
19. Do you have trouble getting along with your teachers?
20. Do you have trouble paying attention in school?
21. Do you have trouble keeping your mind focused?
22. Do you have trouble getting your homework done?
23. Do you have trouble getting along with other students?

Appendix B: Delinquency Index

*The Add Health questions ask the respondent to indicate how many times he or she had committed these offenses within the past year.*

- Painted graffiti
- Damaged Property
- Shoplifted
- Stole something < $50
- Stole something > $50
- Burglarized
- Borrowed a car without permission
- Sold drugs
- Involved in a serious physical fight
- Seriously injured someone
- Used/threatened to use a weapon
- Participated in a group fight
- Pulled a knife/gun on someone
- Shot/stabbed someone