2016

Routine Activities and Delinquency: The Significance of Bonds to Society and Peer Context

Lizabeth A. Crawford
Bradley University

Katherine B. Novak
Butler University, kbnovak@butler.edu

Amia K. Foston
Butler University, afoston@butler.edu

Crime & Delinquency
1–38

DOI: 10.1177/0011128716679795
cad.sagepub.com
SAGE

Routine Activities and Delinquency: The Significance of Bonds to Society and Peer Context

Lizabeth A. Crawford,[1] Katherine B. Novak,[2] and Amia K. Foston[2]

Abstract

This article extends prior research on routine activities and youth deviance by focusing on a broader range of routine activity patterns (RAPs) and on how their effects are conditioned by bonds to society and peer context. As hypothesized, the RAPs with the most consistent effects on delinquency were those lowest, or highest, in both structure and visibility. However, the relationship between school-related activities and delinquency was complex and varied across levels of the moderators in unexpected ways, given the structure and visibility of this RAP. Other RAPs, including unstructured peer interaction, affected delinquency independent of adolescents' social relations, suggesting that neither social bonding nor external social control, via peer group norms, shapes the effects of situationally based opportunities for deviance on adolescents' behaviors in a consistent manner.

Keywords

routine activities, drugs, juvenile delinquency, offending

[1]Bradley University, Peoria, IL, USA
[2]Butler University, Indianapolis, IN, USA

Corresponding Author:
Katherine B. Novak, Department of Sociology and Criminology, Butler University, 4600 Sunset Ave., Indianapolis, IN 46208, USA.
Email: kbnovak@butler.edu

Problem behaviors during adolescence, including alcohol and drug use, are often a precursor to deviant behavior following the transition to adulthood (Mason et al., 2010). Thus, criminologists have sought to identify the social factors that affect adolescents' risks for engaging in these activities. Early research focused largely on the effects of social factors such as bonds to conventional society and peer group norms on youth deviance. More recently, there has been an increased interest in the impact of situational characteristics on deviant behavior, as evidenced by the growing number of studies focusing on the contexts within which adolescents' interactions with peers take place. Most of these analyses are within the routine activities tradition.

Routine Activities and Delinquency

In its original formulation (Cohen & Felson, 1979), routine activities theory emphasizes the relationship between everyday behaviors and crime victimization. The crux of the theory is the idea that the analysis of common everyday behavioral patterns can be used to explain variations in crime rates over time and across areas (Felson & Boba, 2010). Using the routine activities model to explain deviant behavior at the micro-level, Osgood, Wilson, O'Malley, Bachman, and Johnston (1996) locate the motivation for deviance in the social situation. In particular, they suggest that unstructured interaction with peers that takes place in the absence of authority figures (unstructured socializing) is especially conducive to deviance in that it provides ample opportunities for this type of behavior, which makes it both easy and rewarding. The more time youths spend in these kinds of situations, which encompass common behaviors such as going to parties and driving around with friends, the higher their predicted levels of deviance. Conversely, structured activities visible to agents of social control are expected to reduce deviant behavior (Hawdon, 1996; Osgood et al., 1996).

Numerous studies have provided support for this theory. Although the specific outcomes examined have varied across analyses and include measures of alcohol and drug use (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007; Hawdon, 1996, 1999; J. Miller, 2013; Osgood et al., 1996; Thorlindsson & Bernburg, 2006; Vazsonyi, Pickering, Belliston, Hessing, & Junger, 2002); the violation of school rules (Fleming et al., 2008; Wong, 2005); violence (Agnew & Petersen, 1989; Bernburg & Thorlindsson, 2001; J. Miller, 2013; Vazsonyi et al., 2002; Wong, 2005); and theft, property offenses, or other criminal behaviors (Agnew & Petersen, 1989; Barnes et al., 2007; Bernburg & Thorlindsson, 2001; Hawdon, 1999; J. Miller, 2013; Osgood et al., 1996; Svensson & Oberwittler, 2010; Vazsonyi et al., 2002; Wong, 2005), participation in organized leisure activities (e.g., homework, school clubs, and sports)

has been associated with low, and unstructured peer interaction with high, levels of deviance. Thus, the consensus is that routine activities are important determinants of the risk for delinquency.

Nonetheless, the literature on routine activities and youth deviance has not been without criticism. A key concern that has emerged within this context pertains to methodological issues. Although there are a number of longitudinal studies showing that unstructured peer interaction increases the risk for delinquency (Crawford & Novak, 2002; Fleming et al., 2008; Haynie & Osgood, 2005; Hoeben & Weerman, 2014; Osgood et al., 1996), much of the research on other activity patterns has been cross-sectional in design (Agnew & Petersen, 1989; Barnes et al., 2007; Bernburg & Thorlindsson, 2001; Hawdon, 1996, 1999; Thorlindsson & Bernburg, 2006; Vazsonyi et al., 2002; Wong, 2005), making it difficult to determine the causal direction of the relationships in question.

A second potential problem with prior analyses of the routine activity–delinquency relationship has to do with model specification and researchers' failure to control for bonds to conventional society, as conceptualized by Hirschi (1969). Research on unstructured peer interaction and youth deviance has simultaneously examined the effects of social bonding and external, situationally based social control (opportunity) on adolescents' behaviors, holding constant earlier deviance (e.g., Crawford & Novak, 2002; Haynie & Osgood, 2005). However, many longitudinal studies of the effects of other routine activity patterns (RAPs) on delinquency (e.g., Fleming et al., 2008; Osgood et al., 1996) have not included controls for bonds to society. As levels of attachment, commitment, and belief influence adolescents' participation in various activity patterns, as well as their risks for deviance, failing to include measures of social bonds may lead to the overestimation of the magnitude of the effects of routine activities on delinquency (Bernburg & Thorlindsson, 2001; Svensson & Oberwittler, 2010; see also Wong, 2005).

The lack of attention given to adolescents' personal characteristics, and the nature of their social relationships, is a third limitation of the routine activities literature. By locating social control outside of the individual, in the social situation, researchers have overlooked the degree to which adolescents vary in how they experience their interactions with others. As deviance is produced by an intersection of situational opportunities and those personal and social characteristics that support these behaviors, focusing solely on the situations in which behavior occurs may have limited the explanatory power of the routine activities model (Augustyn & McGloin, 2013; Bernburg & Thorlindsson, 2001; Svensson & Oberwittler, 2010).

Bernburg and Thorlindsson (2001) were the first to address this issue. Drawing on Sutherland's (1947) theory of differential association, as well as

Hirschi's (1969) control theory, they emphasize the importance of individual differences in the meanings, cultivated through social relationships, that youth accord to interactive settings in shaping the effects of routine activities on delinquency. From this perspective, bonds to conventional society reflect adolescents' social relations and serve as filters through which they interpret the situations they encounter, and the motivation underlying deviance or conformity is presumed to emerge within this frame of reference. Similarly, peer relationships are seen as critical in facilitating the construction of situational definitions that either inhibit or promote participation in deviant activities in settings conducive to delinquency (Bernburg & Thorlindsson, 2001). By instigating deviant behavior or, at a minimum, making the possibility of delinquency salient, deviant peers may also increase the readiness with which adolescents perceive situational opportunities for delinquency (Hoeben & Weerman, 2016).

Using cross-sectional data, Bernburg and Thorlindsson (2001) found that strong social bonds, measured as attachment to the family and to school, decreased the effect of unstructured and unsupervised peer interaction on delinquent behavior. Friends' deviance also moderated the effect of unstructured peer interaction on delinquency in the predicted manner, such that adolescents who routinely participated in unstructured peer interactions were at the lowest risk for property offenses and violent behaviors when they had friends who did not support or engage in these kinds of activities. Overall, peer context had a stronger effect than social bonding on the unstructured peer interaction–delinquency relationship.

Other studies show a similar effect of social bonding on the relationship between unstructured peer interaction and heavy drinking (Crawford & Novak, 2002), and of peer context on the impact of unstructured peer interaction on alcohol use, drug use (Thorlindsson & Bernburg, 2006), and criminality (Svensson & Oberwittler, 2010). Although friends' behaviors did not condition the effect of unstructured peer interaction on delinquency in Haynie and Osgood's (2005) analysis of the relationship between peer relations and deviance, their measure of unstructured peer interaction reflected only the frequency with which adolescents spent time with friends and did not include any information about the social contexts within which the activities they engaged in took place. In general, measures that assess the context in which peer interaction occurs (and thus the visibility of youth to adults), as well as the structure of peer activities, tend to be more strongly related than the amount of time adolescents spend interacting with peers to levels of deviance (Svensson & Oberwittler, 2010; Weerman, Bernasco, Bruinsma, & Pauwels, 2013).

Despite evidence that both social bonds and peer norms have the potential to influence the effects of unstructured peer interaction on delinquency, the literature on the moderating effects of these contextual factors on the

relationship between other routine activities and youth deviance is sparse. There is, to the authors' knowledge, only one study (Thorlindsson & Bernburg, 2006) that examines how peer context affects the relationship between routine activities other than unstructured peer interaction and deviant behavior, measured as substance use, in this case. As expected, these authors found that participation in sports or in clubs reduced alcohol and drug use most among adolescents with friends who regularly ingested these substances or supported their use. To date, there are no systematic analyses of the impact of social bonding on the effects of routine activities other than unstructured peer interaction on substance use or other forms of delinquency.

Study Purpose

The purpose of this article is to extend the literature on the causes of youth deviance by examining the extent to which bonds to society and peer context moderate the relationship between a variety of routine activities, in addition to unstructured peer interaction, and delinquency. Given the ubiquity of activities such as participation in sports, clubs, community organizations, and hobbies, as well as unstructured socializing, among youth (Agnew & Petersen, 1989; Barnes et al., 2007; Vazsonyi et al., 2002), it is important to understand who is likely to be the most susceptible to the situationally based opportunities for delinquency rooted in these social settings. Determining the degree to which social bonds and peer context condition the effects of routine activities on adolescents' risks for deviance not only has the potential to enhance our understanding of the precursors to adolescent misbehavior, it should provide information of use to those practitioners seeking to reduce delinquency by steering youth toward activities high in both structure and visibility.

We also address the other limitations of the routine activities literature, described earlier in this article. Unlike prior research on routine activities and delinquency, we assess the effects of a variety of routine activities on deviant behavior with controls for both earlier deviance and social bonding.

Hypotheses

Drawing on the studies reviewed earlier, we hypothesize that routine activities low in structure and visibility to agents of social control will increase, whereas routine activities high in both structure and visibility will decrease, adolescents' levels of delinquency. Moreover, we expect the effects of unstructured peer interaction and other non-purposeful, low visibility activities on delinquency to be most pronounced among adolescents low in social bonding or with peers who support unconventional behaviors. Conversely,

we hypothesize that participation in structured activities visible to adults will reduce delinquency most among adolescents low in social bonding or with peers supportive of deviant behavior.

Method

Sample

The data used in this study are from the National Education Longitudinal Survey of 1988 (NELS:88). The NELS is a five-wave panel survey initially administered to a nationally representative sample of approximately 25,000 U.S. eight graders in 1988 (National Center for Education Statistics [NCES], 1996). The study participants were selected using disproportionate stratified cluster sampling, which allowed for the oversampling of Asian and Hispanic students, as well as students attending private schools (NCES, 1994). The data used in this analysis are from Wave 2 (collected in 1990, when students were high school sophomores) and Wave 3 (collected in 1992, during students' senior year). The 1990 and 1992 follow-up surveys, like the initial 1988 questionnaire, were administered in schools in group settings, which yielded an overall response rate of over 90% (NCES, 1996).

We used NELS data for this study because of its longitudinal design and detailed questions on adolescents' everyday activities, which include many measures of common pursuits and unstructured peer interaction. Few longitudinal surveys of youth in the United States have comparable questions that provide this level of contextual information and include detailed measures of social bonding, which were also central to our analyses.

Although the age of the NELS data is less than ideal, past research suggests our findings will generalize to contemporary youth. Research on the effects of unstructured peer interaction, the routine activity most frequently studied, covers over a 25-year time span, during which there has been little change in the effects of this variable on levels of deviance. Although there are fewer prior studies of other RAPs to draw upon, the consensus within the criminological literature is that the processes giving rise to deviance and crime among youth have not substantially changed over time (see Hughes & Short, 2014, for a discussion of this issue). Thus, authors of published studies focusing on various routine activities and delinquency, especially among youth in the United States (e.g., Hawdon, 1996; Morris & Johnson, 2014; Osgood et al., 1996), had to make similar tradeoffs between the availability and age of the data.

Of the 18,116 students in the 1990-1992 NELS sample used in this study, 50% were female and 31% were racial or ethnic minorities. In all analyses,

we used Stata's survey commands to account for the complex, stratified cluster design of the NELS data (StataCorp, 2015).

Measures

Routine activities. Sixteen items from the 1992 questionnaire, administered when respondents were high school seniors, were used to construct the measures of routine activities, our primary independent variables. The majority of these variables, measuring respondents' school-based, social, service, and religious activities, were scored 1 = *never/rarely* to 4 = *every day*. A variable measuring the amount of time respondents spent doing homework was scored on a scale ranging from 0 = *none* to 8 = *over 20 hr per week*. Similarly, the scale for the variable measuring participation in extracurricular activities ranged from 0 = *none* to 7 = *25 or more hr per week*, and the measure of the amount of time respondents spent reading outside of school was scored on a scale ranging from 0 = *none* to 7 = *10 or more hr per week*. Two additional activity variables measured the amount of time students spent playing video games on weekends (0 = *none* to 5 = *5 or more hr per day*) and during the week (0 to 5). Finally, a measure of work hours (limited to work for pay), back coded so that low scores indicated a heavy time commitment, had scores that ranged from 1 (*over 40 hr per week*) to 10 (*not employed*).

A principal components factor analysis, with an oblique rotation of the factor matrix to allow for correlations between factors, revealed that students' responses to the 16 items under investigation reflected the following six spheres of activity: *school-related* (homework, extracurricular activities, and no work for pay), *athletic* (play sports and take sports lessons), *social* (do things with friends and drive/ride around with friends), *community/religious* (participate in community service, religious services, and youth groups), *hobby-oriented* (participate in hobbies, read outside of school, take arts/music/dance classes, and use personal computers), and *video games*. Indicators within each sphere of activity were summed to form a composite measure of routine activities within that domain. When routine behaviors reflecting a particular sphere of activity were scored using different metrics, as was the case with the school-related and hobby-oriented activity clusters, these indicators were standardized, to give them equal weight, before the index was constructed.

Together, the six activity patterns explained 59% of the variance in the 16 indicators included in the analysis. Despite differences in some of the indicators examined across studies, several of our activity clusters (e.g., an orientation toward school activities, athletics, and unstructured interaction with peers) were similar in their underlying themes to those identified in previous studies (Hawdon, 1996, 1999; Thorlindsson & Bernburg, 2006).

Drawing on Hawdon (1996), we refer to these clusters of activities as RAPs. Given the emphasis on the effects of unstructured peer interaction on delinquency in Hawdon's (1996) earlier work, and in the routine activities delinquency literature more generally, the nature of our social RAP bears further discussion.

Due to data constraints, measures of unstructured peer interaction often include indicators of the amount of time respondents spent with friends as well as more context-specific items, such as time spent driving around or visiting local hangouts and other public spaces (e.g., Bernburg & Thorlindsson, 2001; Hawdon, 1996; Osgood et al., 1996; Vazsonyi et al., 2002). In this study, the social RAP was constructed using the only two indicators in the third wave of the NELS (collected during the senior year in high school) that focus on interactions with peers for social purposes—time spent with friends and time spent driving around with friends (a type of unstructured interaction). Although time spent with friends is relatively broad in focus and captures social interactions that may not be unstructured, this item and the more direct measure of unstructured peer interaction (driving around with friends) loaded on a common factor in our principal components factor analysis, suggesting that they reflect a similar underlying construct. For this reason, we opted to combine these two variables into an index.[1]

Among the RAPs under investigation, the most notable theoretically are the social pattern (low in both structure and visibility) and those measures reflecting routine participation in athletic activities, school-related activities, and community/religious activities (high in both structure and visibility). Although there is no evidence that participation in hobbies, apart from school-related extracurricular activities, affects delinquency within the routine activities literature, this measure is comprised of a number of activities high in structure (e.g., hobbies and arts, music, and dance lessons), likely to be visible to parents, teachers, and other agents of social control.

The structure, or purposefulness, of the sixth activity, playing video games, is open to question. However, it is likely to be at least somewhat visible. While video game playing may not be directly supervised by adults, it often takes place in social contexts where adults are present (in the home, in particular).

As we hypothesized, the effect of a given RAP on delinquency should reflect the level of structure and visibility of its component behaviors. While high scores on the social RAP index should increase adolescents' risks for delinquency, high scores on the athletic, school-based, community/religious, and hobby-oriented RAPs should be associated with low levels of deviance. Moreover, drawing on Bernburg and Thorlindsson's (2001) contention that social relations influence the extent to which adolescents perceive and

respond to situational opportunities for deviance, we expect the relationship between the social RAP and delinquency to be strongest when social bonding is low or when friends support unconventional behaviors. Under these conditions, adolescents presumably are the most likely to construct situational definitions conducive to deviance and take advantage of the opportunities for deviant behavior that emerge in situations that do not themselves have characteristics (structure and visibility) that serve to constrain their behaviors. Similarly, the four RAPs high in structure and visibility (the athletic, school-based, community/religious, and hobby-oriented patterns) should have the largest inverse effects on delinquency among adolescents at risk for deviance because they are low in social bonding or have deviant peers.

Bonds to society. Measures reflecting the various bonds to conventional society described by Hirschi (1969) were constructed using data from Time 1, when respondents were high school sophomores. We opted to use Time 1 data for the measures of attachment, commitment, and belief because a number of the requisite items were not included on the survey administered during respondents' senior year.

Attachment was measured using a series of six questions concerning the quality of students' relations with their parents (e.g., My parents treat me fairly). Each item (scored using a 6-point scale ranging from 1 = *false* to 6 = *true*) was coded so that high scores reflected quality student–parent relations and then summed, yielding a composite attachment index with a scale ranging from 6 to 36 ($\alpha = .83$).

Commitment, reflecting the degree to which individuals have invested in conventional activities and institutions (Hirschi, 1969), was measured using students' responses to a series of five questions asking them to indicate how important it was (1 = *not important* to 3 = *very important*) to achieve a range of conventional goals (e.g., "to find steady work," "to help others in the community") and to get good grades (1 = *not important* to 4 = *very important*). These indicators were added together to form a composite index with possible scores ranging from 6 (*low commitment*) to 19 (*high commitment*) ($\alpha = .62$).

Belief, Hirschi's (1969) third bond to society, refers to the extent to which individuals accept the moral validity of conventional norms and laws. We measured this construct by summing respondents' answers to a series of six questions asking them to indicate whether they thought it was okay to violate various school rules. Each question, scored using a 4-point scale ranging from 1 = *always* to 4 = *never*, was coded so that high scores reflected the belief that engaging in each of the behaviors in question was undesirable. The range of possible scores on this measure was 6 (*low belief*) to 24 (*high belief*) ($\alpha = .81$).

Peer context. Peer support for unconventional behaviors at Time 2 was measured by adding four items asking respondents to indicate how important it was among their friends to drink, to use drugs, to study, and to get good grades. Scores on these variables ranged from 1 (*not important*) to 3 (*very important*). The two items focusing on academics (studying and getting good grades) were back coded so that high scorers on all four variables reflected peer support for unconventional activities prior the construction of the index, with possible scores ranging from 4 to 12 ($\alpha = .65$).

Control variables. As strength of religious affiliation and parent–child relations affect the risk for delinquency (Crawford & Novak, 2002; Marcos, Bahr, & Johnson, 1986), measures of these constructs were included in all higher-order analyses as statistical controls. Religiosity was measured at Time 2 using students' responses to a question asking them whether or not they were a religious person (1 = *yes, very*; 2 = *yes, somewhat*; 3 = *no, not at all*). Scores on this variable were reverse coded so that high scores reflected a strong religious affiliation.

Time 2 measures of parent–child relations included an indicator of the amount of time respondents engaged in activities with their parents (1 = *never or rarely* to 4 = *every day*) and an index reflecting the amount of control parents exerted over their children, as reported by respondents. The parental control index was constructed by adding nine items focusing on who makes decisions (parents or self) about a range of issues (e.g., what classes respondents take, whether they date, whether they have a job, and so forth). Response options for each of nine indicators ranged from 1 (*I decide myself*) to 5 (*parents decide*), yielding possible index scores ranging from 9 to 45 ($\alpha = .78$).

Respondents' demographic characteristics (i.e., gender, race, and socioeconomic background) were also included as control variables. Gender was measured as the dummy variable, female, where females received scores of 1 and males received scores of 0 (female = 49%). Race was measured as the dummy variable minority, on which racial/ethnic minorities (Asian, Black, Hispanic, and Native American students) were given a score of 1, and Whites served as the reference category. Socioeconomic background was measured using the composite index of socioeconomic status provided by NCES. This variable included parental education and income, as well as a range of indicators of cultural capital (e.g., owning a home computer).

A final set of control variables, which matched our dependent variables in terms of their structure, included measures of Time 1 alcohol use, marijuana use, and frequency of arrest. We opted to measure delinquency in this fashion, and excluded a series of questions assessing school-based deviance available

in the NELS, so that our outcome variables would be as close in content as possible to those commonly used within the routine activities literature.

The measure of alcohol use reflected the frequency of alcohol consumption and not the severity of use. Focusing on a specific timeframe is not likely to adequately capture general patterns of alcohol use among adolescents (Shope, Copeland, & Dielman, 1994). Thus, we created our measure using indicators of the frequency of lifetime, yearly, and monthly consumption (0 = *0 occasions* to 3 = *20 or more occasions*). As recommended by Shope et al. (1994), we also included the number of times respondents consumed five or more drinks in a sitting during the 2 weeks prior to completing the survey (0 = *none* to 5 = *10 or more times*) in the measure of overall alcohol use. As the indicators of alcohol use were scored using different scales, we standardized these variables, given them equal weight, before constructing the drinking index ($\alpha = .86$).

Time 1 marijuana use was measured as the frequency with which students used marijuana within the past year (0 = *none*, 1 = *1-2 times*, 2 = *3-19 times*, 3 = *20 or more times*), and number of arrests during the first semester of the sophomore year was scored on a scale ranging from 0 (*never*) to 4 (*over 10 times*). As very few respondents were arrested three or more times within this timeframe, we combined the third and fourth response categories, yielding a variable with the following scale: 0 = *none*, 1 = *1-2 times*, 2 = *3 or more times*.

The third delinquency measure, frequency of arrest, is of particular interest because it represents deviant adolescent behavior severe enough to be formally sanctioned. Prior analyses of routine activities and delinquency have focused on a range of problem behaviors, many of which are illegal. Thus, the inclusion of frequency of arrest as a dependent variable increases the scope of our analysis and makes it more consistent with the focus of earlier studies.

Unfortunately, with the exception of arrest frequency, the NELS does not include measures of delinquency other than alcohol and drug use that are not immediately tied to a school context—items not appropriate for analysis given our interest in routine activities and situationally based opportunities for delinquency. However, by examining the frequency with which respondents were arrested (vs. whether or not they had ever been arrested), we were able to distinguish adolescents regularly engaging in criminal behavior from those with few or no offenses. Studies on the effects of routine activities on youth deviance often use global measures of delinquency to assess the overall frequency with which adolescents engaged in a range of criminal activities (e.g., burglary, robbery, theft, vandalism, and assault). While the NELS data do not provide information about why respondents were arrested, there is a substantial degree of overlap between the types of offenses likely to result in adolescent arrest (U.S. Department of Justice, Office of Justice Programs,

2013) and the behaviors measured by these general delinquency indices (see, for example, Farineau & McWey, 2011; Svensson & Oberwittler, 2010; Weerman et al., 2013). Given this, our measure of arrest frequency is likely to be capturing the same kinds of offenses as those investigated in prior studies on routine activities and delinquency.

Arrests, however, involve subjective assessments on the part of authorities as well as the nature of adolescents' behaviors. This outcome could be more readily influenced than measures of delinquency based on the offenses actually committed by labeling processes tied to status characteristics such as social class and race. The strong relationship between the nature of the offense and the likelihood of arrest, irrespective of perpetrators' status characteristics (see, for example, Gottfredson & Gottfredson, 1988; Piquero & Brame, 2008), suggests that labeling processes are not likely to exert a substantial impact on arrest frequency. While the risk for arrest may reflect the visibility of adolescents' routine activities, potentially dampening their effect on this outcome, the strong link between type of offense and arrest is also likely to minimize this type of bias.

Nonetheless, it is important to recognize that not all crimes result in arrest. For this reason, our measure of arrest is likely to underestimate the overall frequency with which survey respondents' engaged in criminal behaviors and provide conservative estimates of the effects of the various routine activities under investigation.

Preliminary analyses showed that scores on the arrest variable and the other three Time 1 measures of delinquency (alcohol use and marijuana use) were only minimally correlated ($r = .16$, $p < .001$ and .19 $p < .001$, respectively). The correlation between measures of alcohol use and marijuana use was also low-to-moderate ($r = .45$, $p < .001$).

Dependent variables. The same questions about students' use of alcohol and marijuana, and number of arrests, administered at Time 2 (during the senior year), served as dependent variables in this analysis ($\alpha = .87$ for the index of alcohol use). Once again, the arrest variable, with response options ranging from 0 = *none* to 5 = *over 15 times* at Time 2, was collapsed into the following three-category scale: 0 = *none*, 1 = *1-2 times*, 2 = *3 or more times*. Correlations between measures were similar to those observed among the Time 1 delinquency variables (alcohol-marijuana, $r = .46$, $p < .001$; alcohol-arrest, $r = .15$, $p < .001$; marijuana-arrest, $r = .20$, $p < .001$).

Results

Descriptive statistics for the variables under investigation are presented in Table 1. Model variables include some imputed data for missing values.

These imputations were generated using Stata's chained equations imputation command (StataCorp, 2015). The proportion of missing observations for each imputed variable in all of our regression models ranged from 0 for the sex variable (female) to 0.266 for the "attachment" social bond variable.

Ordinary least squares regression models were run to assess the extent to which the various routine activity patterns influenced high school seniors' levels of alcohol use. This analysis was conducted using a series of steps, enabling us to assess the relative effects of the routine activities on drinking, alone and in combination with bonds to society and peer context. In the first step, we estimated a baseline model, including routine activities, Time 1 delinquency, social bonds, peer context, and the other control variables. The second statistical model included all of the variables in the initial model, plus all cross-product interactions between routine activities and attachment. The third model included all of the variables in the additive model and all cross-product interactions between routine activities and commitment. The fourth statistical model included the variables in the additive model and interactions between routine activities and belief, and the final model predicting students' levels of alcohol consumption included interactions between routine activities and peer context.

Our final results are shown in Table 2. Regressions that yielded non-significant cross-product interactions are not presented here. Thus, Table 2 shows the baseline model (column 1) and a second model (column 2), which includes the only significant cross-product interaction between the RAPs and bonds to society or peer context (the community/religious RAP × belief). For our other dependent variables, marijuana use and arrest, we estimated the effects of routine activities, net of the effects of the various control variables, on these outcomes using multinomial logistic regression.[2] The results of the multinomial logistic regressions predicting marijuana use and arrest are presented in Tables 3 and 4, respectively. In both cases, 0 (no marijuana use/no arrests) served as the reference category. Cross-product interactions were added into the base model using the same series of steps described in relation to alcohol use. Significant interactions between bonds to society, or peer context, and routine activities and each of the dependent variables are presented on the right-hand side of Table 3 (marijuana use) and Table 4 (arrest), respectively.

Direct Effects of RAPs on Substance Use and Arrest

Alcohol use. As shown in Table 2, four of the six RAPs (athletic, social, community/religious, and hobby-related) affected adolescents' levels of alcohol consumption when bonds to society and prior drinking behavior were held

Table 1. Descriptive Statistics (N = 14,977).

	M	*SD*	Range
Female	0.51	0.50	0-1
Minority	0.28	0.45	0-1
Socioeconomic Status	0.08	0.80	−2.94-2.75
Religiosity	1.83	0.66	1-3
Do things with parents	2.86	1.00	1-4
Parental control	22.50	7.45	9-45
Peers support for unconventional activities	6.08	1.69	4-12
RAPs			
School-related	0.01	1.99	−5.36-5.96
Athletic	2.93	1.39	2-8
Social	6.40	1.55	2-8
Community/religious	4.85	1.90	3-12
Hobby-oriented	−0.01	2.43	−3.48-10.42
Video games	1.36	1.98	0-10
Social bonds			
Attachment	29.12	5.91	6-36
Commitment	16.86	1.86	6-19
Belief	19.72	3.31	6-24
Delinquency: Time 1			
Alcohol use	0.05	3.40	−3.92-11.05
Marijuana use, past year	0.20	0.60	0-3
Marijuana use, past 30 days	0.10	0.42	0-3
Arrests	0.03	0.20	0-2
Delinquency: Time 2			
Alcohol use	0.05	3.40	−4.79-8.63
Marijuana use, past year	0.33	0.77	0-3
Marijuana use, past 30 days	0.17	0.55	0-3
Arrests	0.04	0.23	0-2

Note. RAPs = routine activity patterns.

constant. With the exception of the athletic pattern, which was positively related to alcohol consumption, these effects were in the expected direction. Social interaction with peers, low in both structure and visibility increased drinking, while participation in activities that were both more purposeful and readily observed by adults—namely, hobbies and community/religious activities—reduced adolescents' use of alcohol. With the exception of commitment, which increased levels of alcohol consumption, an unexpected finding,

Table 2. Regression Models Predicting Time 2 Alcohol Use (N = 14,977).

	Model 1	Model 2
	B (*SE*)	*B* (*SE*)
Constant	−3.72*** (.52)	−4.90*** (.74)
Female	−0.30*** (.08)	−0.30*** (.08)
Minority	−0.33*** (.08)	−0.33*** (.08)
Socioeconomic Status	0.22*** (.06)	0.22*** (.06)
Religiosity	−0.12 (.07)	−0.12 (.07)
Time with parents	−0.21*** (.04)	−0.20*** (.04)
Parent control	−0.02*** (.01)	−0.02*** (.01)
Time 1 alcohol	0.45*** (.01)	0.45*** (.01)
Peers unconventional	0.46*** (.03)	0.46*** (.03)
Social bonds		
Attachment	0.00 (.01)	0.00 (.01)
Commitment	0.05** (.02)	0.05* (.02)
Belief	−0.02 (.01)	0.04 (.03)
RAPs		
School	−0.03 (.02)	−0.03 (.02)
Athletic	0.13** (.04)	0.12** (.04)
Social	0.29*** (.03)	0.29*** (.03)
Community/religious	−0.09** (.02)	0.18 (.12)
Hobby	−0.08*** (.02)	−0.08*** (.02)
Video games	0.04 (.02)	0.04 (.02)
Belief × Community/religious		−0.01* (.01)
R^2	.46	.47
Akaike Information Criteria	69,872.84	69,859.04
Bayesian Information Criteria	70,009.90	70,003.71

Note. RAPs = routine activity patterns.
*p < .05. **p < .01. ***p < .001.

bonds to society did not impact students' drinking behaviors. Peer context (having peers who supported deviance), however, was a strong predictor of students' levels of alcohol consumption.

Marijuana use. In our second set of analyses, presented in Table 3, two RAPs, the social and school patterns, were consistently related to marijuana use, with effects in the expected direction (unstructured peer interaction increased, while participation in school-related activities decreased, the risk for marijuana use). To get a better sense of the magnitude of these effects, we used the

Table 3. Multinomial Logistic Regression Models Predicting Time 2 Marijuana Use, Past Year (N = 14,977).

	Model 1			Model 2		
	1-2 occasions	3-19 occasions	20+ occasions	1-2 occasions	3-19 occasions	20+ occasions
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	−4.67*** (0.75)	−5.18*** (0.75)	−9.18*** (1.06)	−1.20 (1.39)	−4.18* (1.98)	−6.91** (2.16)
Female	0.11 (0.14)	0.17 (0.12)	−0.28 (0.18)	0.11 (0.14)	0.17 (0.12)	−0.27 (0.18)
Minority	0.17 (0.15)	0.02 (0.18)	−0.18 (0.20)	0.18 (0.15)	0.02 (0.18)	−0.17 (0.20)
Socioeconomic Status	0.18* (0.07)	0.34*** (0.08)	0.47*** (0.12)	0.18* (0.07)	0.34*** (0.08)	0.47*** (0.12)
Religiosity	−0.12 (0.09)	−0.17 (0.11)	−0.13 (0.15)	−0.12 (0.09)	−0.17 (0.11)	−0.13 (0.15)
Time parents	−0.06 (0.08)	−0.14* (0.06)	−0.20* (0.09)	−0.06 (0.08)	−0.14* (0.06)	−0.20* (0.09)
Parent control	0.01 (0.01)	−0.00 (0.01)	−0.02 (0.01)	0.01 (0.01)	−0.00 (0.01)	−0.02 (0.01)
Time 1 marijuana use	0.88*** (0.09)	1.17*** (0.09)	1.50*** (0.11)	0.88*** (0.09)	1.17*** (0.09)	1.50*** (0.11)
Peers unconventional	0.28*** (0.03)	0.43*** (0.04)	0.76*** (0.04)	0.28*** (0.03)	0.43*** (0.04)	0.75*** (0.04)
Social bond						
Attachment	−0.02 (0.01)	0.01 (0.01)	−0.01 (0.01)	−0.02 (0.01)	0.01 (0.01)	−0.01 (0.01)
Commitment	0.02 (0.03)	0.00 (0.05)	0.02 (0.04)	−0.20* (0.08)	−0.01 (0.13)	−0.12 (0.14)
Belief	−0.02 (0.02)	−0.08*** (0.02)	−0.04 (0.02)	−0.02 (0.02)	−0.08*** (0.02)	−0.04 (0.02)
RAPs						
School	−0.06* (0.03)	−0.08** (0.03)	−0.18*** (0.05)	−0.06* (0.03)	−0.08** (0.03)	−0.18*** (0.05)
Athletic	0.12 (0.07)	0.05 (0.05)	0.10 (0.08)	0.12 (0.07)	0.05 (0.05)	0.10 (0.08)
Social	0.19*** (0.04)	0.23*** (0.04)	0.31*** (0.06)	−0.35 (0.20)	0.08 (0.29)	−0.04 (0.31)
Community/religious	−0.13** (0.04)	−0.07 (0.05)	−0.10 (0.06)	−0.13** (0.04)	−0.07 (0.05)	−0.11 (0.05)
Hobby	−0.01 (0.02)	0.01 (0.03)	0.05 (0.03)	−0.01 (0.02)	0.01 (0.03)	0.05 (0.03)
Video games	−0.02 (0.02)	0.00 (0.03)	0.04 (0.04)	−0.02 (0.02)	0.00 (0.03)	0.04 (0.03)
Commitment × Social				0.03** (0.01)	0.01 (0.02)	0.02 (0.02)
Pseudo-R^2		.21			.21	
Akaike Information Criteria		16,223.50			16,222.35	
Bayesian Information Criteria		16,634.67			16,656.36	

Note. Reference category is "never used marijuana" (0 occasions). RAPs = routine activity patterns.
*p < .05. **p < .01. ***p < .001.

logit coefficients shown in Table 3 (in columns 1, 2, and 3, respectively) to determine the change in adolescents' odds of infrequent (1-2 occasions), moderate (3-19 occasions), or heavy (20 or more occasions) marijuana use, versus abstention, associated with a standard deviation increase in the social, and then in the school-related, RAP.

A standard deviation increase in the social RAP increased adolescents' odds of being infrequent marijuana users during the past year, versus non-users, by a factor of 1.34. The effects of the social RAP on moderate and heavy marijuana use (vs. abstention) were somewhat larger. A standard deviation increase in the social RAP increased the odds of moderate, and heavy, marijuana use (vs. abstention) by a factor of 1.42 and by 1.62, respectively.

Overall, the effects of the school-based RAP on adolescents' odds of infrequent, moderate, or heavy marijuana use (vs. abstention) were slightly weaker than those of the social pattern. A standard deviation increase in the school RAP decreased adolescents' odds of being an infrequent marijuana user, versus an abstainer, by a factor of 0.89. Students' odds of being moderate or heavy marijuana users, versus abstainers, decreased by factors of 0.85 and 0.70, respectively.

The effects of one other RAP—the community/religious orientation—on marijuana use was less consistent across categories of this dependent variable. This RAP reduced adolescents' likelihoods of infrequent, versus no, marijuana use (Δ odds = .78, per a standard deviation increase).

Overall, bonds to society had fewer direct effects on marijuana use than the RAPs. Attachment and commitment did not significantly predict low, moderate, or heavy use (vs. abstention). Belief was, however, related to an increased risk for moderate, versus no, marijuana use. Not surprisingly, unconventional peer context had strong positive effects across the different consumption categories (low/moderate/heavy vs. no, marijuana use).

Arrest. As shown in Table 4, the same general pattern persisted for the model predicting arrest. Unconventional peer context and two RAPs, but none of the social bonds, were significantly related to this outcome. Students who spent a significant amount of time engaging in school-related activities were less likely to have been arrested 1 to 2 (vs. 0) times, when bonds to society and number of arrests 2 years earlier, during the sophomore year in high school, were held constant. Conversely, playing video games increased adolescents' likelihoods of having been arrested many (3 or more) times, versus having never been arrested (Table 4).[3] Converting the logit coefficients to odds revealed that a standard deviation increase in video gaming increased the likelihood of adolescents having many (3 or more), versus no, arrests by a factor of 1.32. A standard deviation increase in the school-based RAP

Table 4. Multinomial Logistic Regression Models Predicting Time 2 Arrest (N = 14,977).

	Model 1		Model 2		Model 3	
	1-2 times	3+ times	1-2 times	3+ times	1-2 times	3+ times
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	−4.22*** (0 .88)	−7.04*** (1.98)	−3.70*** (0.88)	−6.69*** (1.92)	−4.17*** (0.86)	−7.21*** (2.04)
Female	−0.97*** (0.18)	−1.71*** (0.41)	−0.96*** (0.18)	−1.70*** (0.40)	−0.99*** (0.18)	−1.72*** (0.41)
Minority	−0.11 (0.20)	−0.28 (0.35)	−0.08 (0.18)	−0.26 (0.34)	−0.04 (0.18)	−0.18 (0.34)
Socioeconomic Status	−0.16 (0.12)	−0.48** (0.18)	−0.14 (0.12)	−0.47** (0.18)	−0.11 (0.11)	−0.39* (0.19)
Religiosity	−0.11 (0.13)	0.11 (0.26)	−0.11 (0.13)	0.11 (0.26)	−0.12 (0.13)	0.10 (0.26)
Time parents	−0.17 (0.10)	−0.20 (0.13)	−0.17 (0.10)	−0.20 (0.13)	−0.19 (0.10)	−0.23 (0.13)
Parent control	−0.01 (0.01)	0.02 (0.02)	−0.01 (0.01)	0.02 (0.02)	−0.01 (0.01)	0.02 (0.02)
Time 1 arrest	1.41*** (0.24)	1.61*** (0.31)	1.42*** (0.24)	1.62*** (0.30)	1.42*** (0.22)	1.61*** (0.32)
Peers unconventional	0.22*** (0.04)	0.44*** (0.07)	0.22*** (0.04)	0.44*** (0.07)	0.22*** (0.05)	0.49*** (0.10)
Social bond						
Attachment	−0.00 (0.02)	0.00 (0.03)	−0.00 (0.02)	0.00 (0.03)	−0.00 (0.01)	0.00 (0.03)
Commitment	−0.01 (0.04)	−0.07 (0.06)	−0.02 (0.03)	−0.07 (0.06)	−0.01 (0.04)	−0.07 (0.06)
Belief	−0.03 (0.03)	−0.05 (0.05)	−0.06* (0.03)	−0.07 (0.05)	−0.03 (0.02)	−0.06 (0.05)
RAPs						
School	−0.10* (0.05)	−0.10 (0.08)	0.33* (0.16)	0.19 (0.26)	−0.53*** (0.13)	−0.92** (0.28)
Athletic	0.11 (0.07)	0.15 (0.11)	0.12 (0.07)	0.15 (0.10)	0.11 (0.07)	0.14 (0.10)

(continued)

Table 4. (continued)

	Model 1		Model 2		Model 3	
	1-2 times	3+ times	1-2 times	3+ times	1-2 times	3+ times
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Social	0.11 (0.06)	−0.08 (0.09)	0.11* (0.06)	−0.08 (0.09)	0.12* (0.06)	−0.07 (0.09)
Community/ religious	−0.02 (0.07)	0.15 (0.08)	−0.02 (0.07)	0.15 (0.08)	−0.02 (0.07)	0.14 (0.08)
Hobby	−0.08 (0.04)	−0.04 (0.08)	−0.08 (0.04)	−0.04 (0.08)	−0.07 (0.04)	−0.04 (0.08)
Video games	0.05 (0.04)	0.14*** (0.04)	0.05 (0.04)	0.14*** (0.04)	−0.18 (0.11)	−0.02 (0.22)
Belief × School			−0.02* (0.01)	−0.02 (0.02)		
Peers unconventional × School					0.06** (0.02)	0.10** (0.03)
Peers unconventional × Video games					0.03* (0.01)	0.02 (0.03)
Pseudo-R^2	.17		.17		.17	
Akaike Information Criteria	4,108.86		4,105.05		4,100.75	
Bayesian Information Criteria	4,382.97		4,394.39		4,405.32	

Note. Reference category is never arrested. RAPs = routine activity patterns.
*$p < .05$. **$p < .01$. ***$p < .001$.

decreased adolescents' odds of having been arrested 1 or 2 times, versus never having been arrested, by a factor of .81.

Although the RAPs examined had notably fewer direct effects on the frequency of arrest than on either alcohol or marijuana use, there were more significant cross-product interactions in this last set of analyses. In particular, peer context emerged as an important moderator of the relationship between participation in school-related activities, high in both structure and visibility, and arrest. We discuss the nature of this, as well as the other significant RAP by social bond interactions, in the following sections.

Moderating Effects of Bonds to Society

Across analyses, there were three significant interactions between RAPs, social bonding, and delinquency (community/religious by belief on drinking, social by commitment on marijuana use, and school by belief on arrest). The direction of the first interaction, between the community/religious RAP, belief, and alcohol use (Table 2, column 2), was interpreted using the method suggested by Ross, Mirowsky, and Huber (1983). Using this procedure, we computed predicted drinking scores associated with a standard deviation increase (i.e., from a low to a high score) on each of the independent variables of interest (the community/religious RAP and belief). The predicted drinking scores generated using this procedure are presented in Figure 1. As shown here, participation in community/religious activities reduced drinking among all adolescents, but this effect was largest among individuals high in belief.

The regression models with interaction terms in Table 3 (marijuana use) and Table 4 (arrest) indicate that the focal relationships between delinquent outcomes and certain routine activity patterns are moderated by social bonds and/or peer context. To better understand and illustrate the RAP by social bond interaction effects, we graphed how the predicted probabilities of each delinquent outcome (relative to the statistically significant routine activity patterns) varied across the moderator variable(s), while holding all other variables in the model at their means. For consistency of presentation, the interaction graphs were formatted with the moderators along the horizontal axes, instead of the RAPs. The Stata command used to calculate the predicted probabilities (i.e., margins) requires x-axis variables to contain only nonnegative integers and one of the RAPs did not meet this criterion.

Figure 2 shows the effects of commitment on the relationship between the social RAP and marijuana use. As indicated here, moderation occurred primarily at the low end of the commitment scale. Thus, as hypothesized, the social RAP increased the risk for both moderate (3-19 times) and heavy (20 or more times) marijuana use primarily among adolescents low in

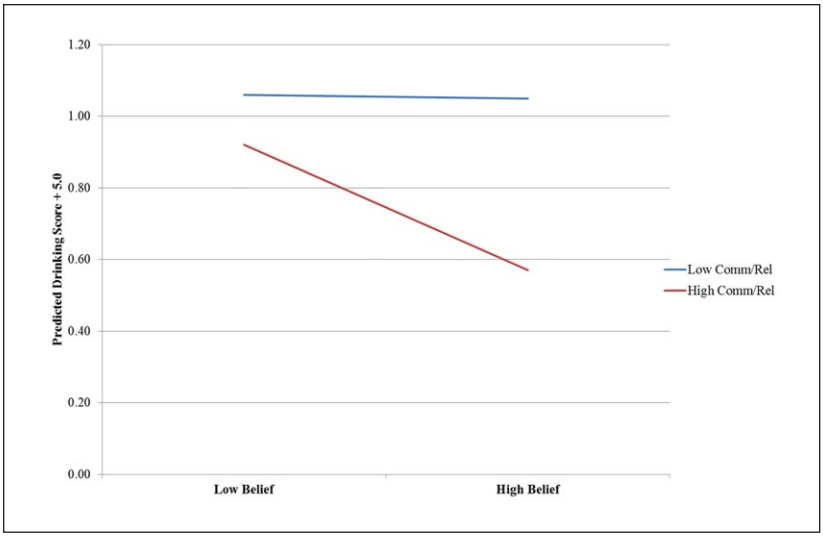


Figure 1. Effects of participation in community/religious activities on alcohol use by belief (*N* = 14,977).

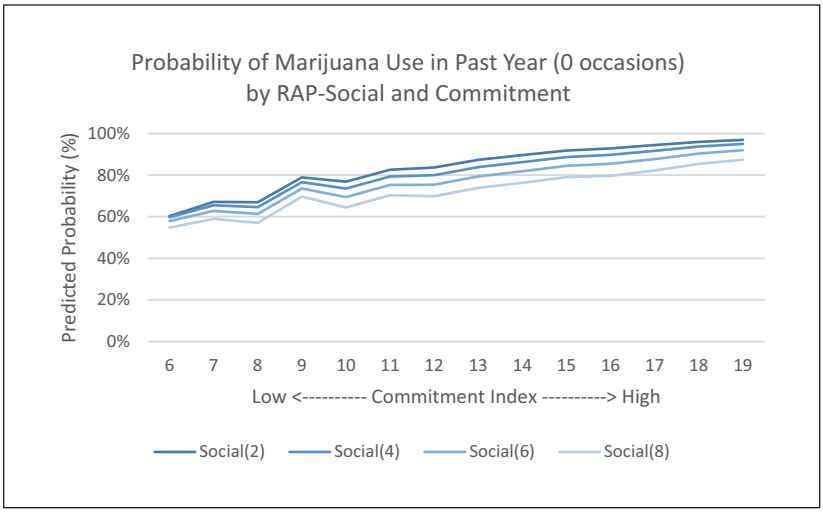
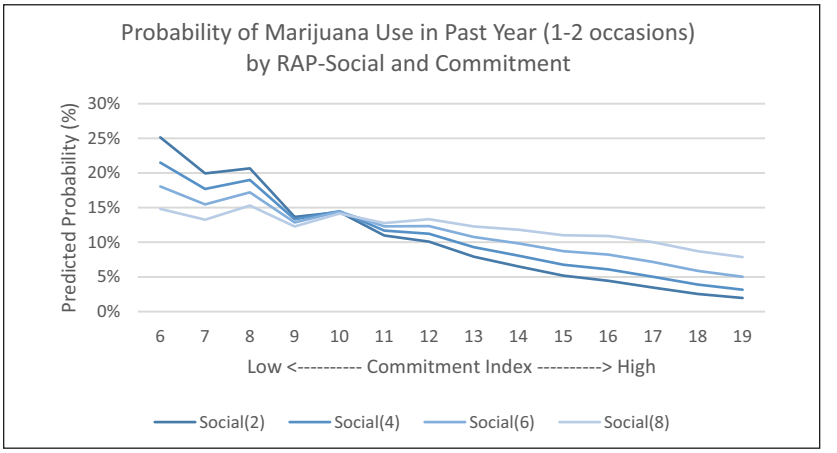


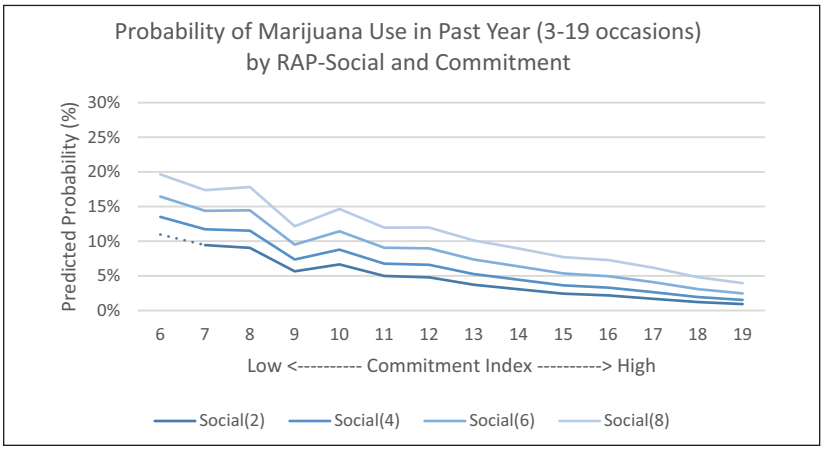
Figure 2. Effects of participation in unstructured peer interactions on marijuana use (past year) by commitment (*N* = 14,977).
0 occasions.
Note. The RAP-Social scale ranges from 2 to 8.

1-2 occasions.



Note. The RAP-Social scale ranges from 2 to 8.

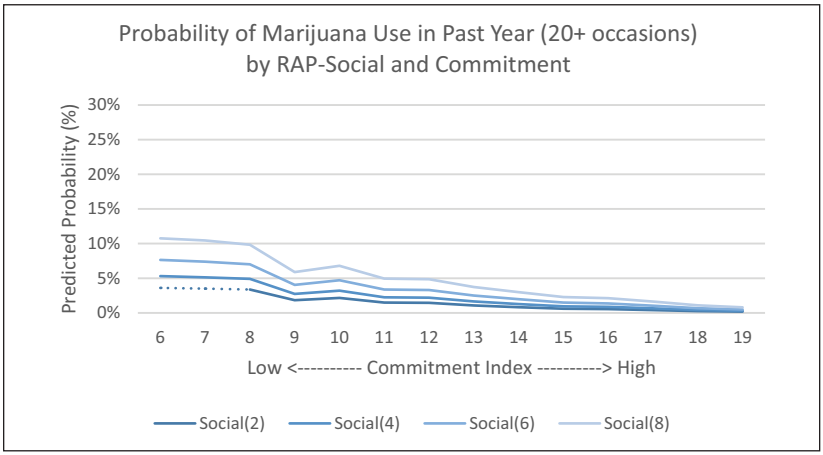
3-19 occasions.



Note. The RAP-Social scale ranges from 2 to 8. Dashed portions of the graph lines are not statistically significant ($p > .05$).

commitment. At low commitment, students with high scores on the social RAP were at the greatest risk for being a marijuana user and of using this drug frequently (on 3-19 or 20 or more occasions). The pattern for

20+ occasions.



Note. The RAP-Social scale ranges from 2 to 8. Dashed portions of the graph lines are not statistically significant ($p > .05$). RAP = routine activity pattern.

infrequent use (1-2 occasions) was different. Here, respondents who spent the least amount of time interacting with peers were at the greatest risk for marijuana use at low commitment. In contrast, at high commitment, students who spent the most time interacting with peers were at the greatest risk for infrequent marijuana use.

The moderating effect of belief on the school RAP is presented in Figure 3. Once again the greatest conditioning effect is evident at the low end of the moderator. However, it was not in the predicted direction. At low belief, the overall risk of not being arrested increased with decreases in scores on the school RAP.

This effect was even more pronounced for one to two arrests. At low belief, adolescents with the highest scores on the school RAP (individuals who spent 45 or more hours doing homework and engaging in extracurricular activities and did not work for pay) had a 21% chance of having been arrested one or two times, while the probability of this outcome was 11% for individuals with the lowest scores on the school RAP (students who worked 40 or more hours per week and never did homework or participated in extracurricular activities). However, at high belief, we see the expected pattern—a higher school RAP score reduces the risk of having one or two arrests. Belief did not affect the direction or magnitude of the relationship between the school RAP and the risk for multiple (3 or more) arrests.

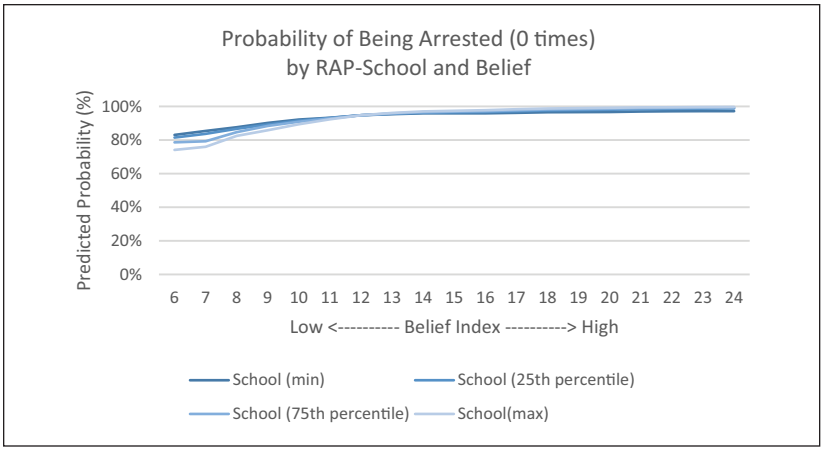
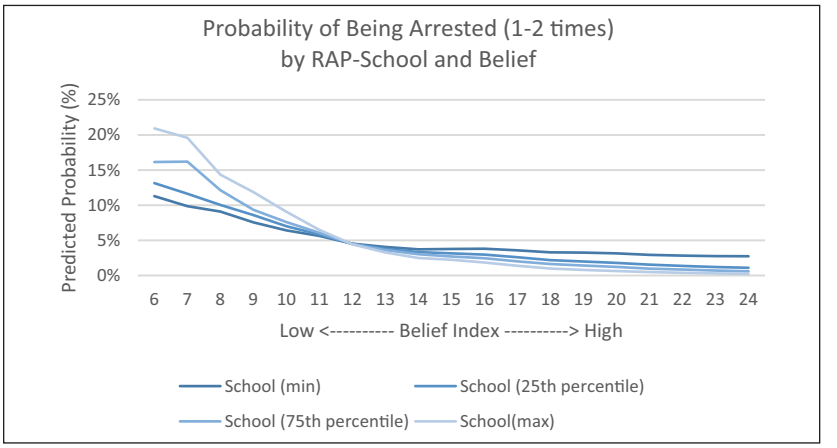


Figure 3. Effects of participation in school activities on arrest by belief (N = 14,977).
0 times.
Note. The standardized RAP-School scale ranges from −5.36 to +5.96.

1-2 times.

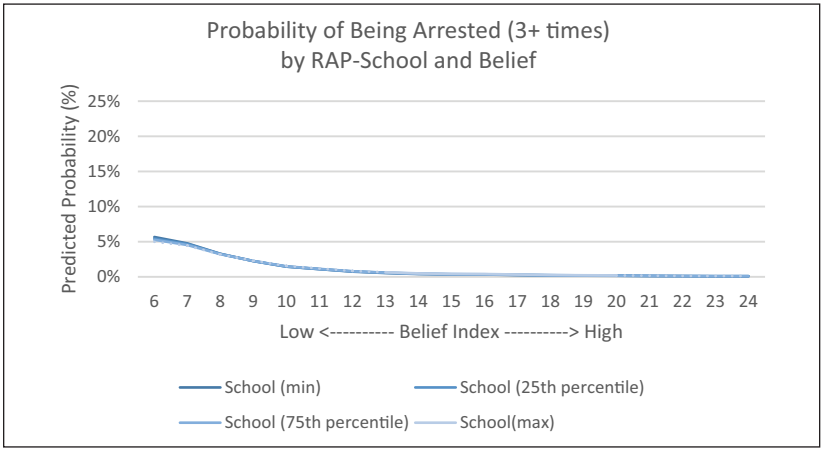


Note. The standardized RAP-School scale ranges from −5.36 to +5.96.

Moderating Effects of Peer Context

There were only two significant RAP by peer context interactions. Both the school and the video game RAPs varied across levels of friends' support for deviance in their effects on arrest. To determine the direction of these effects, we calculated

3+ times.



Note. The standardized RAP-School scale ranges from −5.36 to +5.96. Dashed portions of the minimum and maximum school graph lines are not statistically significant ($p > .05$). RAP = routine activity pattern.

predicted probabilities of arrest at varying levels of both the school and video game RAP across levels of peer context using the procedure described earlier.

As shown in Figure 4, there were no moderation effects for low peer context scores when predicting the effects of the school RAP on the overall probability of having never been arrested. At the high end of the scale, however, unconventional peer context reduced the probability of not being arrested differently for various school RAP scores. Surprisingly, the highest peer context score appeared to have the biggest effect on the maximum school RAP score—reducing the probability of not being arrested from virtually 100% to 51%. By way of comparison, the probability of not being arrested for respondents with the minimum school RAP score (and highest peer context score) fell from close to 100% to 84%.

There were also limited moderation effects of unconventional peer context on the focal relationship between being arrested 1 to 2 times and the school RAP. As in the prior figures, the moderation effects of unconventional peer context emerge at the higher end of the scale. As expected, higher unconventional peer context scores correspond to higher probabilities of being arrested 1 to 2 times. However, at the highest peer context score, the arrest probabilities for the various school RAP scores, which ranged from 9% (lowest school RAP) to 12% (highest school RAP), were not in the predicted direction.

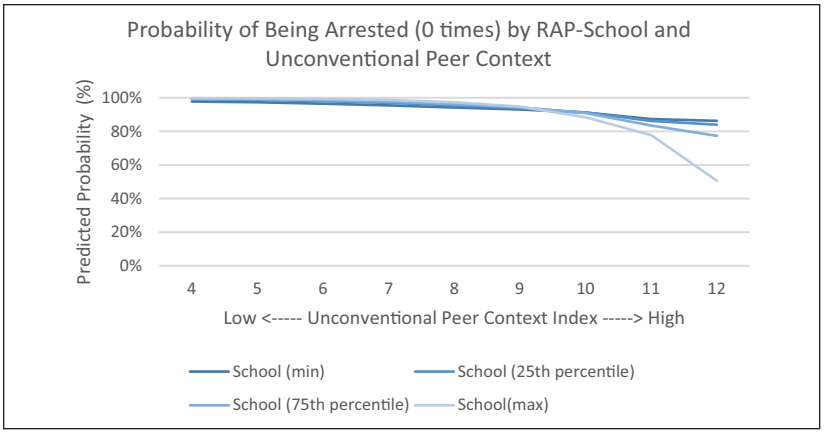
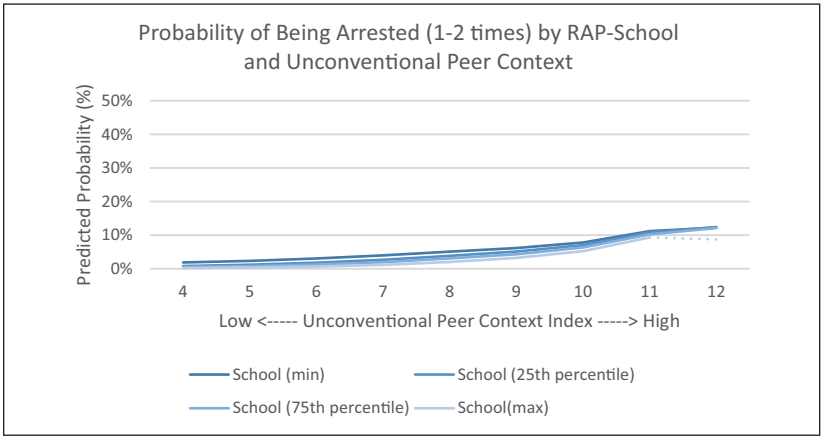


Figure 4. Effects of participation in school activities on arrest by unconventional peer context (N = 14,977).
Never arrested (0 times).
Note. The standardized RAP-School scale ranges from −5.36 to +5.96.

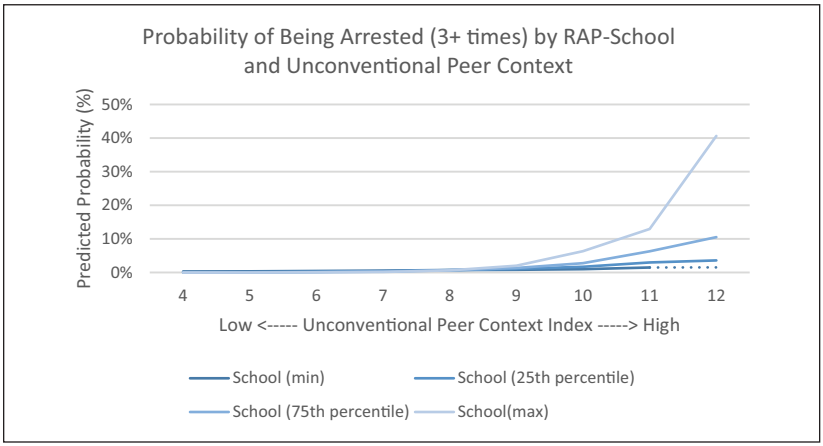
1-2 times.



Note. The standardized RAP-School scale ranges from −5.36 to +5.96. The dashed portions of the graph lines are not statistically significant (p > .05).

The probability of being arrested 3 or more times follows this pattern but, in this case, the moderation effects appear to dominate the school RAP effects. While we expected an increased likelihood of being arrested to correspond to

3+ times.



Note. The standardized RAP-School scale ranges from −5.36 to +5.96. Dashed portions of the graph lines are not statistically significant ($p > .05$). RAP = routine activity pattern.

higher unconventional peer context scores in this instance, we did not anticipate the findings regarding peer context and the school RAP. Respondents with the lowest school RAP score coupled with the highest unconventional peer context score should have the highest predicted probability of being arrested 3 or more times, but the opposite occurred. As shown in Figure 4, the respondents most likely to be arrested 3 or more times (probability = 41%) had the highest school RAP score. Conversely, the respondents least likely to be arrested 3 or more times (probability = 2%) at the high end of the unconventional peer context scale had the lowest school RAP scores.

The next set of graphs (Figure 5) pertains to the effect of peer context on the relationship between video games and arrest. As shown in Figure 5, at the low end of the scale, unconventional peer context had little to no moderation effect on the relationship between not being arrested and playing video games. Respondents show a high probability (nearly 100%) of not being arrested regardless of their video game playing frequency up to Level 8 on the unconventional peer context scale. Beyond Level 8, the moderation effect of peer context becomes more pronounced. At the highest level of unconventional peer context, the probability of not being arrested falls from nearly 100% down to 83% for respondents who never played video games. For students who played video games most frequently, their probability of not being arrested fell to 71%. Conversely, their probability of being arrested rose from nearly 0% at the minimum unconventional peer context score to 29% at the maximum unconventional peer context score.

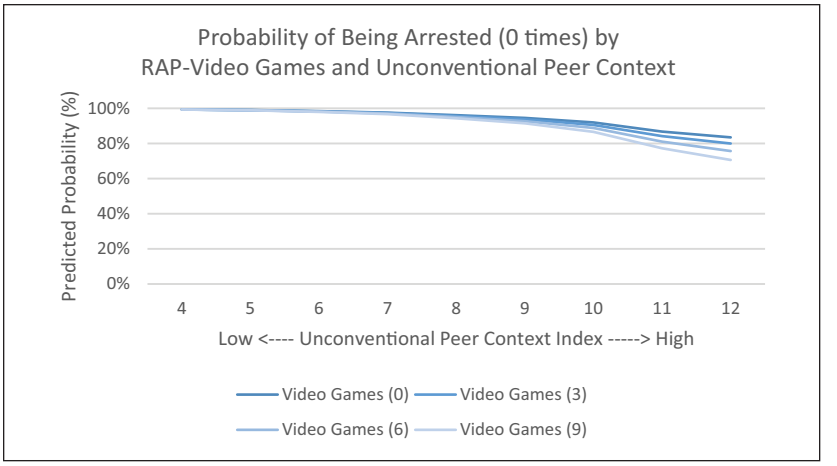
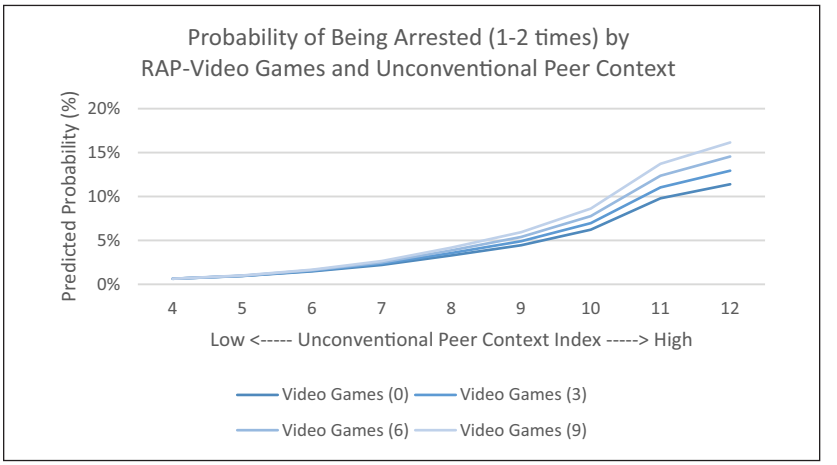


Figure 5. Effects of playing video games on arrest by unconventional peer context (N = 14,977).
Never arrested (0 times).
Note. The RAP-Video Game scale ranges from 0 to 10.

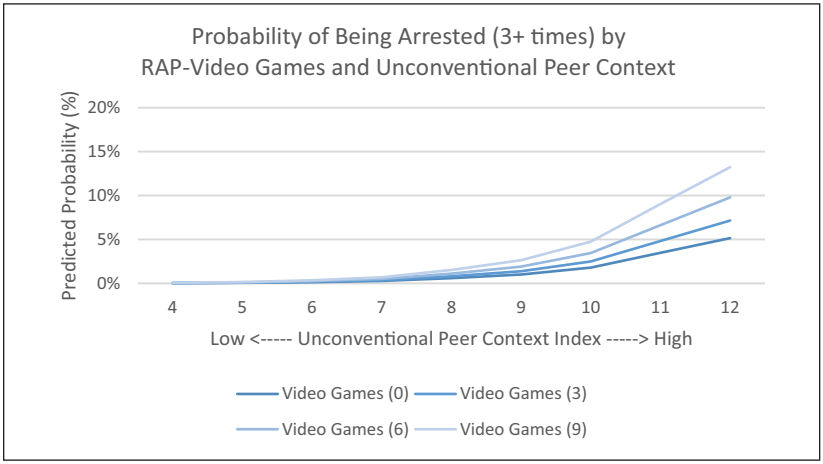
1-2 times.



Note. The RAP-Video Game scale ranges from 0 to 10.

In terms of both infrequent (1-2) and frequent (3 or more) arrests in relation to the video game RAP, there is, once again, no moderation effect when peer context scores are low but a considerable moderation effect at the high

3+ times.



Note. The RAP-Video Game scale ranges from 0 to 10. RAP = routine activity pattern.

end of the scale. For respondents who frequently played video games all week, their probability of being arrested 1 to 2 times reached 16% at the maximum unconventional peer context score, compared with 11% for respondents who never played video games. Similarly, respondents who frequently played video games and have the maximum score on the unconventional peer context scale had a 13% probability of being arrested 3 or more times, compared with 5% for those who never played video games.

Discussion

To date, few analyses have examined the effects of multiple routine activity patterns on delinquency among adolescents using longitudinal data. Overall, our results indicate that a number of routine activity patterns, in addition to unstructured social interaction, influence adolescents' risk for substance use and arrest when prior deviance, as well as social bonds, are taken into consideration. Across analyses, RAPs were better predictors than social bonds of delinquency.

It is not surprising that the RAPs with the largest direct effects on adolescent substance use—the social orientation, which increased the risk for both alcohol and marijuana use, and the school-related orientation, which reduced the risk for these outcomes—were comprised of activities at the end of the structure and visibility continuums. This pattern of results supports the contention that it is these contextual characteristics that affect delinquency and is

consistent with prior research findings based on the analysis of cross-sectional data (Hawdon, 1996, 1999; Thorlindsson & Bernburg, 2006).

Nonetheless, the athletic orientation had effects that were unexpected. Despite the high structure and visibility of the behaviors comprising this RAP (playing sports and taking sports lessons), this measure had no impact on marijuana use or arrests, and it increased, rather than decreased, high school seniors' levels of alcohol consumption.

Research on sports and delinquency suggests that this relationship is complex and may reflect a variety of factors in addition to social control (Sokol-Katz, Kelley, Basinger-Fleischman, & Braddock, 2006), including students' identities. Among high school athletes, alcohol use is frequently an integral component of peer culture and perceived as central to the role of athlete-student (Grossbard et al., 2009; K. E. Miller et al., 2003). The effect of the athletic RAP on drinking, but not marijuana use or arrest frequency, among the study sample is consonant with this latter finding.

Interestingly, the social orientation, which has been associated with delinquency in prior longitudinal studies (Fleming et al., 2008; Haynie & Osgood, 2005; Hoeben & Weerman, 2014; Osgood et al., 1996), did not affect the risk for arrest. In fact, with the exception of the school-based and video patterns, none of the routine activities examined influenced this outcome. This may be a reflection of the nature of this dependent variable, which was somewhat limited in scope given the items available in the NELS data set. On the other hand, it may mean that routine activities, including unstructured peer interaction, have fewer effects on the most severe forms of delinquency. Consistent with this interpretation, unstructured peer interaction was not related to either violence (Hoeben & Weerman, 2016) or assault (Müller, Eisner, & Ribeaud, 2013), types of deviance serious enough to result in arrest if detected by authorities, in two earlier longitudinal studies.

In addition to addressing the methodological issues identified at the beginning of the article, this study extends prior research on youth deviance by identifying social factors with the potential to modify the effects of a range of routine activities on substance use and delinquency severe enough to result in legal consequences. Bernburg and Thorlindsson (2001) suggest that strong social bonds, or peers who support conventional behavior, will facilitate the construction of situational definitions that reduce the likelihood that adolescents will perceive, or take advantage of, situationally based opportunities for misbehavior. On the other hand, low social bonding, or peers who support deviance, are likely to give rise to situational definitions conducive to deviance, which should exacerbate the effects of the situationally based opportunities for delinquency rooted in routine activities. Thus, we expected the effects of routine activities on delinquency

to be strongest among individuals with weak social bonds or with peers who supported unconventional behavior.

We found little support for these hypotheses, as most of the effects of the RAPs on delinquency across our analyses were direct and did not vary by either bonds to society or peer context. Of particular note is the fact that peer context did not condition the effect of unstructured peer interaction on any of our dependent variables. This is not consistent with the results of prior cross-sectional analyses (Bernburg & Thorlindsson, 2001; Svensson & Oberwittler, 2010; Thorlindsson & Bernburg, 2006). It is, however, in line with the results of Haynie and Osgood's (2005) longitudinal study of the peer–delinquency relationship and supports their conclusion that peer interaction and peer group norms have independent effects on youth deviance.

Despite the lack of strong evidence that bonds to society or peer context moderate the effect of RAPs on delinquency in a consistent fashion, we did find that the effect of the social RAP on heavy marijuana use was strongest among adolescents low in commitment. The determinants of infrequent marijuana use did not, however, fit this latter pattern. Perhaps this is because this type of marijuana use reflects experimentation with the drug, which is more common and potentially less stigmatized than more stable/consistent use. While the risk for infrequent marijuana use among low belief, low social RAP youth is likely due to factors (e.g., poor social skills) not encompassed by this analysis, this would explain the elevated risk for this outcome among students high on the social RAP at high commitment. It also provides insight into why commitment was positively related to drinking, another fairly common, and accepted, behavior among high school students.

Other significant interactions (the community/religious RAP by belief on drinking and the school RAP by both belief and peer context on arrest) were not in the expected direction. Still, they do provide some insight into when, and why, routine activities predict delinquency.

It was primarily among high belief adolescents that participation in community and religious activities reduced drinking. This suggests that levels of external control, associated with the structure and visibility of this RAP, are determinants of deviant behavior primarily among adolescents who view conventional rules as morally valid. Among adolescents low in this form of social bonding, the risk for deviance was high irrespective of their levels of exposure to situationally based opportunities for delinquency through involvement in community or religious activities. This is not inconsistent with Bernburg and Thorlindsson's (2001) arguments concerning the importance of social bonds in shaping how adolescents perceive and respond to their social interactions. The change in the impact of the school RAP on arrest across levels of belief

and peer context also supports their contention that social factors shape the extent to which routine activities affect levels of deviance.

It was not, however, until the top of the unconventional peer context scale that the school RAP exerted an impact on the risk for arrest, at which point these activities increased, rather than decreased, the probability of this outcome. Social learning processes, through which adolescents acquire definitions favorable to deviant behavior (Akers, 1977), provide an explanation for the strong impact of unconventional peer context on delinquency across analyses and may be of relevance to the latter effect. School-related extracurricular activities serve as the basis for the formation and maintenance of adolescents' friendships (Schaefer, Simpkins, Vest, & Price, 2011). Thus, students who spend a substantial amount of time engaging in school-based activities are likely to be spending a substantial amount of time with their friends. This should increase their influence, and promote situational definitions conducive to deviance among adolescents when friends are supportive of this type of behavior, even when the activities in which they participate do not themselves result in situational opportunities for delinquency.

The intensity of peer contact associated with heavy participation in school-based activities might also explain why students with the highest scores on this RAP were at risk for arrest if they did not regard conventional rules as morally valid. Frequent contact with peers is likely to increase adolescents' opportunities to connect with individuals with similar orientations toward delinquency (Farineau & McWey, 2011; Urberg, Degirmencioglu, & Tolson, 1998). For students low in belief, then, heightened peer contact could facilitate situational definitions conducive to deviance, and to the commission of offenses severe enough to result in arrest, even within the context of routine activities without the characteristics (low structure and low visibility) associated with opportunities for delinquency. Farineau and McWey (2011) found a similar inverse relationship between participation in extracurricular activities and serious delinquency to that observed between the school RAP and arrest in the current study. Their sample was comprised of adolescents in foster care who, as they note, were likely to be low in social bonding. Future studies might focus on how school-related activities impact the intensity of peer interaction and how this, along with the nature of the activities themselves, combine with social bonds as well as peer norms to influence the risk for deviant behavior.

Although we had no specific hypotheses concerning the nature of the effects of the final RAP, playing video games, on delinquency by levels of social bonding or peer context, given the questionable structure and visibility of this activity pattern, it substantially increased the risk for arrest among adolescents with peers who supported deviant behavior. This could reflect the

characteristics of the activity itself (low structure) and the context within which it occurred (low visibility). Alternatively, playing video games might have been related to other characteristics that increase the risk for delinquency (e.g., low peer acceptance) that were not measured in this study.

To date, there is a lack of consensus within the literature as to the extent to which playing video games is a precursor of deviance. A number of studies have linked violent video games to negative outcomes, including aggression (Anderson, 2004) and delinquency (Exelmans, Clusters, & Van den Bulck, 2015). Other analyses, have, however, shown no effect of violent video gaming on these and other negative outcomes (Ferguson, Olson, Kutner, & Warner, 2014; Ferguson et al., 2008; Savage & Yancey, 2008). Recently, Morris and Johnson (2014) found that adolescents with deviant peers who spent time playing video games of any type were not at risk for violence or general delinquency. Their study, based on the analysis of Add Health data, included controls for respondents' demographic characteristics and bonds to society.

The discrepancy between the results of Morris and Johnson's earlier study and our findings is puzzling, given the similarity in measures and the timeframe during which the data were collected (early/mid-1990s). Additional research is needed to determine the degree to which the type of video games played, and the context in which this activity occurs (e.g., with friends or with strangers via the Internet, at home or in public arenas), influences the nature of its effects on adolescent problem behavior. Although the breadth of the items pertaining to adolescents' activities in the NELS renders the use of this database advantageous, the age of the data may limit the generalizability of our results concerning the effects of playing video games, which have changed substantially over the years and now involve the Internet, and delinquency.

Another limitation of our study pertains to the nature of our measure of serious delinquency. Like the global indices of delinquency commonly used within the routine activities literature, frequency of arrest, our indicator of delinquency severe enough to result in formal sanctions, did not distinguish between different categories of deviant behavior. Moreover, as all crimes do not result in arrest, this measure is likely to have underestimated the overall frequency with which the study respondents' engaged in criminal behaviors, which might have minimized the observed effects of the RAPs to some degree. Future prospective studies might examine the effects of routine activities and adolescents' social relations on a wider variety of outcomes, including violence, assault, theft, and property crimes. This could further contribute to our understanding of the extent to which situationally based opportunities for deviance, alone and in combination with bonds to society and peer context, vary in their effects across different forms of delinquency.

From a theoretical standpoint, our results are significant in that they bolster Bernburg and Thorlindsson's (2001) argument that adolescents differ in how they define their interactions and call into question routine activity theorists' assumption that situations contain global meanings. Going beyond the results of prior studies, our findings suggest that that low commitment to conformity increases the risk for frequent marijuana use among adolescents who regularly engage in unstructured interaction with peers, while belief is especially important in shaping adolescents' risk for delinquency in response to involvement in community/religious or school-based activities. They also point to the importance of examining peer context when considering the consequences of participation in school-related extracurricular activities.

However, the nature of the latter effects suggests that the relationship between routine activities, social control, and differential associations may be more complex than what has been suggested within the literature. Our results pertaining to the school RAP, in particular, indicate that the intense peer contact likely to be experienced by students heavily involved in school-based extracurricular activities may counteract the effects of the characteristics of the activities themselves (their high structure and visibility), which tend to reduce deviance more generally, if they are at risk for delinquency due to other factors (low belief or unconventional peer group norms). Moreover, as most of the observed effects of the RAPs on delinquency were not moderated by either social bonds or peer context, our findings provide little overall support for the contention that focusing solely on social situations, and overlooking the nature of individuals' personal characteristics and peer relationships, has significantly reduced the explanatory power of the routine activities theory of delinquency.

This has some practical implications. Unstructured socializing is often viewed as problematic among youth with deviant peers, and practitioners have advocated for after-school programs and other purposeful activities that target these subgroups (Taheri & Welsh, 2016; Thurman, Giacomazzi, Reisig, & Mueller, 1996). Our results support the efficacy of this type of intervention, especially as a means to reducing substance use, and suggest that it should be relatively broad in its utility. The independent effects of unstructured peer interaction and peer context on measures of alcohol and marijuana use in our analyses indicate that programs that reduce participation in unstructured social activities in unsupervised settings would be of benefit to adolescents irrespective of their peer affiliations.

This is not, however, to imply that youth will necessarily benefit from increased participation in structured and supervised activities. To the contrary, our findings suggest that, at high levels, involvement in school-related

extracurricular activities, which tend to increase adolescents' exposure to peers, solidify their friendships, and expand their social networks (Schaefer et al., 2011), may increase the risk for delinquency serious enough to result in arrest among students who do not believe in the moral validity of conventional rules or who have friends supportive of deviance.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. We compared the effects of the social routine activity pattern (RAP) on each of our measures of delinquency to those of the more direct indicator of unstructured peer interaction (driving around with friends) in a series of preliminary analyses. Their effects were close to identical, further indicating that our social RAP is adequately capturing the frequency with which respondents participated in unstructured peer interaction.
2. Initially, we examined marijuana and arrest dependent variables (ordered categorical variables) using ordinal logistic regression, but the full models in the original data set violated the parallel regression assumption in both cases. The significant test statistics below indicate violation of the Brant test for parallel regression: Arrest (all variables), $\chi^2 = 51.80$, $df = 17$, $p < .001$; Marijuana use in past year (all variables), $\chi^2 = 89.65$, $df = 34$, $p < .001$.
3. Additional analyses yielded no significant cross-product interactions between the RAPs under investigation, race or socioeconomic status, and any of our three dependent variables. This supports our contention that labeling processes are not likely to have had a significant impact on our results.

References

Agnew, R., & Petersen, D. M. (1989). Leisure and delinquency. *Social Problems*, *36*, 332-350.

Akers, R. L. (1977). *Deviant behavior: A social learning approach* (2nd ed.). Belmont, CA: Wadsworth.

Anderson, C. A. (2004). An update on the effects of playing violent video games. *Journal of Adolescence*, *27*, 113-122.

Augustyn, M. B., & McGloin, J. M. (2013). The risk of informal socializing with peers: Considering gender differences across predatory delinquency and substance use. *Justice Quarterly*, *30*, 117-143.

Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2007). Adolescents' time use: Effects on substance use, delinquency and sexual activity. *Journal of Youth and Adolescence*, *36*, 697-710.

Bernburg, J. G., & Thorlindsson, T. (2001). Routine activities in social context: A closer look at the role of opportunity in deviant behavior. *Justice Quarterly*, *18*, 543-567.

Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review*, *44*, 588-608.

Crawford, L. A., & Novak, K. B. (2002). Parental and peer influences on adolescent drinking: The relative impact of attachment and opportunity. *Journal of Child & Adolescent Substance Abuse*, *12*, 1-26.

Exelmans, L., Clusters, K., & Van den Bulck, J. (2015). Violent video games and delinquent behavior in adolescents: A risk factor prospective. *Aggressive Behavior*, *41*, 267-279.

Farineau, H. M., & McWey, L. M. (2011). The relationship between extracurricular activities and delinquency of adolescents in foster care. *Children and Youth Services Review*, *33*, 963-968.

Felson, M., & Boba, R. L. (2010). *Crime and everyday life: Insights and implications for society*. Thousand Oaks, CA: Pine Forge Press.

Ferguson, C. J., Olson, C. K., Kutner, L. A., & Warner, D. E. (2014). Violent video games, catharsis seeking, bullying, and delinquency: A multivariate analysis of effects. *Crime & Delinquency*, *60*, 764-784.

Ferguson, C. J., Rueda, S. M., Cruz, A. M., Ferguson, D. E., Fritz, S., & Smith, S. M. (2008). Violent video games and aggression: Causal relationship or by product of family violence and intrinsic violence motivation? *Criminal Justice and Behavior*, *35*, 311-332.

Fleming, C. B., Catalano, R. F., Mazza, J. J., Brown, E. C., Haggerty, K. P., & Harachi, T. W. (2008). After-school activities, misbehavior in school, and delinquency from the end of elementary school to the beginning of high school. *Journal of Early Adolescence*, *28*, 277-303.

Gottfredson, M. R., & Gottfredson, D. M. (1988). *Decision making in criminal justice: Toward the rational exercise of discretion* (2nd ed.). New York: Plenum Press.

Grossbard, J. R., Gesiner, I. M., Mastroleo, N. R., Kilmer, J. R., Turisi, R., & Larimer, M. E. (2009). Athletic identity, descriptive norms, and drinking among athletes transitioning to college. *Addictive Behaviors*, *34*, 352-359.

Hawdon, J. E. (1996). Deviant lifestyles: The social control of daily routines. *Youth & Society*, *28*, 162-189.

Hawdon, J. E. (1999). Daily routines and crime: Using routine activities as measures of Hirschi's involvement. *Youth & Society*, *30*, 395-416.

Haynie, D. L., & Osgood, D. W. (2005). Reconsidering peers and delinquency: How do peers matter? *Social Forces*, *84*, 1109-1130.

Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.

Hoeben, E. M., & Weerman, F. M. (2014). Situational conditions and adolescent offending: Does the impact of unstructured socializing depend on its location? *European Journal of Criminology*, *11*, 481-499.

Hoeben, E. M., & Weerman, F. M. (2016). Why is involvement in unstructured socializing related to adolescent delinquency? *Criminology*, *54*, 242-281.

Hughes, L. A., & Short, J. F. (2014). Partying, cruising, and hanging in the streets: Gangs, routine activities, and delinquency and violence in Chicago, 1959-1962. *Journal of Quantitative Criminology*, *30*, 415-451.

Marcos, A. C., Bahr, S. J., & Johnson, R. E. (1986). Test of a bonding/association theory of adolescent drug use. *Social Forces*, *65*, 135-161.

Mason, W. A., Hitch, J. E., Kosterman, R., McCarty, C. A., Herrenkohl, T. I., & Hawkins, J. D. (2010). Growth in adolescent delinquency and alcohol use in relation to young adult crime, alcohol use disorders, and risky sex: A comparison of youth from low- versus middle-income backgrounds. *Journal of Child Psychology and Psychiatry*, *51*, 1377-1385.

Miller, J. (2013). Individual offending, routine activities, and activity settings: Revisiting the routine activity theory of general deviance. *Journal of Research in Crime & Delinquency*, *50*, 390-416.

Miller, K. E., Hoffman, J. H., Barnes, G. M., Farrell, M. P., Sabo, D., & Melnick, M. J. (2003). Jocks, gender, race, and adolescent problem drinking. *Journal of Drug Education*, *33*, 445-462.

Morris, R. G., & Johnson, M. C. (2014). Sedentary activities, peer behavior, and delinquency among American youth. *Crime & Delinquency*, *60*, 939-968.

Müller, B., Eisner, M., & Ribeaud, D. (2013). *Unstructured socializing and different types of early adolescent delinquency: Risk factor or selection effect?* (Forschungsbericht aus der Reihe z-proso, Z¨urcher Projekt zur Socialen Entwicklung von Kindern Nr. 16. Zu¨ rich). Retrieved from http://e-collection.library.ethz.ch/eserv/eth:7958/eth-7958-01.pdf

National Center for Education Statistics. (1994). *National Education Longitudinal Study of 1988: Second follow-up student component data file user's manual* (NCES No. 94374). Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (1996). *Methodology report—National Education Longitudinal Study: 1988-1994* (NCES 96-174). Washington, DC: U.S. Department of Education.

Osgood, D. W., Wilson, J. K., O'Malley, P. M., Bachman, J. G., & Johnston, L. (1996). Routine activities and individual deviant behavior. *American Sociological Review*, *61*, 635-655.

Piquero, A. R., & Brame, R. W. (2008). Assessing the race-crime and ethnicity-crime relationship in a sample of serious adolescent delinquents. *Crime & Delinquency*, *54*, 390-422.

Ross, C. E., Mirowsky, J., & Huber, J. (1983). Dividing work, sharing work, and in-between: Marriage patterns and depression. *American Journal of Sociology*, *48*, 809-823.

Savage, J., & Yancey, C. (2008). The effects of media violence exposure on criminal aggression: A meta-analysis. *Criminal Justice and Behavior*, *35*, 772-791.

Schaefer, D. R., Simpkins, S. D., Vest, A. E., & Price, C. D. (2011). The contribution of extracurricular activities to adolescent friendships: New insights through social network analysis. *Developmental Psychology*, *47*, 1141-1152.

Shope, J. T., Copeland, L. A., & Dielman, T. E. (1994). Measurement of alcohol use and misuse in a cohort of students followed from grade 6 through grade 12. *Alcoholism: Clinical & Experimental Research*, *18*, 726-733.

Sokol-Katz, J., Kelley, M., Basinger-Fleischman, L., & Braddock, H. J. (2006). Reexamining the relationship between interscholastic sports participation and delinquency: Type of sport matters. *Sociological Focus*, *39*, 173-192.

StataCorp. (2015). *Stata statistical software: Release 14*. College Station, TX: Author.

Sutherland, E. H. (1947). *Principles of criminology* (4th ed.). New York, NY: Lippincott.

Svensson, R., & Oberwittler, D. (2010). It's not the time they spend, it's what they do: The interaction between delinquent friends and unstructured routine activity on delinquency: Findings from two countries. *Journal of Criminal Justice*, *38*, 1006-1014.

Taheri, S. A., & Welsh, B. C. (2016). After-school programs for delinquency prevention: A systematic review and meta-analysis. *Youth Violence and Juvenile Justice*, *14*, 272-290.

Thorlindsson, T., & Bernburg, J. G. (2006). Peer groups and substance use: Examining the direct and interactive effect of leisure activity. *Adolescence*, *41*, 321-339.

Thurman, Q. C., Giacomazzi, A. L., Reisig, M. D., & Mueller, D. G. (1996). Community-based gang prevention and intervention: An evaluation of the neutral zone. *Crime & Delinquency*, *42*, 279-295.

Urberg, K. A., Degirmencioglu, S. M., & Tolson, J. M. (1998). Adolescent friendship Selection and termination: The role of similarity. *Journal of Social and Personal Relationships*, *15*, 703-710.

U.S. Department of Justice, Office of Justice Programs. (2013). *Juvenile arrests 2010* (Juvenile Offenders and Victims: National Report Series Bulletin). Retrieved from http://www.ojjdp.gov/pubs/242770.pdf

Vazsonyi, A. T., Pickering, L. E., Belliston, L. M., Hessing, D., & Junger, M. (2002). Routine activities and deviant behavior: American, Dutch, Hungarian, and Swiss youth. *Journal of Quantitative Criminology*, *18*, 397-422.

Weerman, F. M., Bernasco, W., Bruinsma, G. J. N., & Pauwels, L. J. R. (2013). When is spending time with peers related to delinquency? The importance of where, what, and with whom. *Crime & Delinquency*, *61*, 1386-1413.

Wong, S. K. (2005). The effects of adolescent activities on delinquency: A differential involvement approach. *Journal of Youth and Adolescence*, *34*, 321-333.

Author Biographies

Lizabeth A. Crawford is an associate professor of Sociology in the Department of Sociology and Social Work at Bradley University. Her primary research interests are in the areas of social psychology, youth deviance, and the sociology of mental health.

Katherine B. Novak is a professor of Sociology in the Department of Sociology and Criminology at Butler University. Her current research focuses on youth and adolescent substance use and abuse in different social contexts.

Amia K. Foston is an administrator at Butler University. He received his PhD in Sociology from Indiana University - Bloomington in 2015.