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Abstract

Objectives. To examine (1) whether selection into unstructured socializing is related to risk factors for delinquency or to previous delinquent involvement and (2) whether unstructured socializing predicts specific types of delinquency, i.e. shoplifting, vandalism and assault.

Methods. Two waves of self-reported data of 11.3- and 13.7-year olds (N=1032) from the Zurich Project on the Social Development of Children and Youths were analyzed. Selection into unstructured socializing was assessed in lagged regressions; effects of unstructured socializing on delinquency were examined in concurrent models, adjusting for previous delinquency.

Results. Low self-control, moral values, poor parental monitoring and delinquent friends longitudinally predicted unstructured socializing. Adolescents who reported vandalism or a higher variety of delinquency were more likely to be involved in later unstructured socializing. There was no such effect for shoplifting or assault. Unstructured socializing predicted increases in shoplifting, vandalism and variety of delinquency, while it was not related to assault.

Conclusions. The findings are largely consistent with routine activity theory, yet we find that delinquency and unstructured socializing share common risk factors. That unstructured socializing has no effect on assault warrants further examination. Findings are limited by the unspecific measure of unstructured socializing. Future research should further differentiate activity patterns.

Keywords: routine activity, leisure, time use, opportunity, delinquency, youth, early adolescence
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How adolescents spend their leisure time is a major concern to parents, policy makers and scholars. Research has shown that certain leisure activities are associated with behavior problems, such as gambling (e.g. Moore and Ohtsuka 2000), substance use (e.g. Thorlindsson and Bernburg 2006) or delinquency (e.g. Vazsonyi, Pickering, Belliston, Hessing, and Junger 2002). The relationship between unstructured socializing with peers (e.g. hanging around) and delinquency has drawn particular attention. Based on the routine activity approach, Osgood, Wilson, O’Malley, Bachman and Johnston (1996) proposed that individuals involved in unstructured socializing with peers in the absence of authority figures were more frequently engaged in delinquent behavior than those who spent their leisure time with other activities. This relationship has been corroborated in several studies (e.g. Anderson and Hughes 2009; Haynie and Osgood 2005; Mahoney and Stattin 2000; Osgood et al. 1996).

Early adolescence is an important developmental period with regards to problem behavior, delinquency (Coley, Morris, and Hernandez 2004) and unstructured socializing (Agnew 2003). As children grow older, parents allow them more time to spend with their friends away from adults. Parental limits to unstructured socializing with peers have been found to decline in a linear way from age 5 to age 17 (Osgood, Anderson, and Shaffer 2005). Adolescents also gradually travel further away from their home. In addition, the transition between primary and secondary school is assumed to be crucial for the selection of new leisure activities (Fleming, Catalano, Mazza, Brown, Haggerty, and Harachi 2008). While much of the research on the relationship between unstructured socializing and delinquency considers older adolescents, typically starting in high school (e.g. Barnes, Hoffman, Welte, Farrell, and Dintcheff 2007; Hawdon 1996; Osgood et al. 1996), results of developmental studies suggest that this relationship is also upheld for younger children (e.g. Fleming et al.
The routine activity approach assumes that delinquency is situationally motivated. As different types of delinquency depend on different opportunities and incentives, we may need separate models for each specific type of delinquency (Clarke and Cornish 1985). Little research has been done to address this issue, with most of the literature highlighting similar relationships between unstructured socializing and different categories of delinquency (e.g. Anderson and Hughes 2009; Bernburg and Thorlindsson 2001).

The majority of the research on the effects of unstructured socializing is cross-sectional. Some scholars have therefore raised concerns about possible selection effects into unstructured socializing with peers (Haynie and Osgood, 2005; Mahoney and Stattin, 2000). Adolescents with certain risk factors for delinquency could be more likely to spend their leisure time unstructured with peers. Adolescents who were delinquent in the past may even choose unstructured socializing in order to commit delinquent acts more easily (Bernburg and Thorlindsson, 2001; Hawdon, 1996). While some studies account for this possibility by controlling for previous delinquency levels (e.g. Haynie and Osgood 2005; Osgood et al. 1996), only a few studies have looked more closely into the mechanisms that influence the selection of unstructured socializing (e.g. Goldstein, Davis-Kean, and Eccles 2005; Maimon and Browning 2010).

Against this background, the present study focuses on early adolescence, a stage of life that is characterized by an increase in unstructured socializing with peers and in delinquent involvement (Agnew 2003; Coley, Morris, and Hernandez 2004). We address two main issues: First, we investigate selection effects into unstructured socializing with peers. Second,
we examine whether unstructured socializing with peers is linked to different types of juvenile delinquency, once possible selection effects are taken into account. We expect that different situational motivations lie behind different types of delinquency. In addition to a variety measure of delinquency, we therefore analyze three types of delinquency separately: shoplifting, vandalism and assault.

THEORETICAL BACKGROUND

Criminologists’ interest in unstructured socializing largely stems from two theoretical perspectives: routine activity perspective and social control theory. The routine activity approach proposes that every day activities provide opportunities for different types of behavior. Crime occurs when a) motivated offenders come together with b) suitable targets in c) the absence of capable guardians (Cohen and Felson 1979). While the original authors focused on changes in crime rates, Osgood and his colleagues (1996) extended this perspective to individual offending. They propose that offending occurs in situations where a deviant act is possible and rewarding, with no authority figure present to exert social control. Based on these assumptions, the authors presume that individuals who spend more time in unstructured socializing with peers in the absence of authority figures are more frequently engaged in delinquent behavior. According to the authors, leisure activities that are conducive to delinquency are both unsupervised and unstructured. Unlike unstructured activities, structured leisure activities (e.g. boy/girls scouts, organized sports) offer fewer opportunities for delinquency, because they focus on specific activities, have a set agenda and someone is usually responsible for social control. Being with friends makes deviance easier and more rewarding. Friends can serve as useful resources for delinquent actions (e.g., as lookouts for shoplifting or as back-ups in a fight). In addition, friends can act as an audience for deviant behavior and provide symbolic rewards, such as enhanced status in the peer group (Osgood et al. 1996; Warr 2002).
Other researchers (e.g. Agnew and Petersen 1989; Hawdon 1996; Hawdon 1999; Wong 2005) drew on social control theory, stating that leisure activities are connected to Hirschi’s (1969) four types of the bond to society (i.e., attachment, commitment, involvement, and belief). Agnew and Peterson (1989) proposed that participation in activities with parents or conventional institutions (e.g., school) strengthens attachment to these social agents. School activities can also increase the level of commitment to conventional institutions, because individuals invest time and energy in them. Individuals with a strong involvement in conventional leisure activities may find delinquency less attractive. Finally, school and family related leisure activities enhance the belief in the common value system of a society because they provide conventional role models and foster conventional values. Unstructured socializing with peers, however, is not supervised by conventional adults and does not focus on conventional tasks (Agnew and Petersen 1989). Not only does this type of leisure activity foster opportunities for delinquency, it may also weaken the bonds to parents, conventional institutions and conventional goals in the long term.

**Situational mechanisms and different types of delinquency**

Scholars who are interested in stable differences between individuals tend to see different types of delinquency as manifestations of a larger personality syndrome (e.g. Farrington 1992; Gottfredson and Hirschi 1990; Le Blanc and Loeber 1998). They consider offenders as versatile and assume that one model can explain all types of crimes (Farrington 2005). However, scholars who concentrate on situational aspects of delinquency argue that we may need separate models for specific types of crime. Clarke and Cornish (1985) propose that even if the same individuals are involved in different kinds of criminal activities, their particular delinquent actions originate in different circumstances. They distinguish three types of opportunities with increasing complexity: “presented opportunities” (e.g. shoplifting),
“sought opportunities” (e.g. burglary) and “created or planned opportunities” (e.g. bank robbery). Following their classification, the current paper only considers presented opportunities. This is in line with Osgood and his colleagues (1996) who believe that delinquency in unstructured peer contexts is casual and spontaneous.

Farrington (2005) proposes a distinction between a very general long-term potential for antisocial behavior and a short-term potential, which is more specific for distinct types of delinquency. The short-term potential for delinquency is influenced by energizing factors (e.g. being bored or angry), opportunities, victims and the subjective expected utility of offending in a particular situation. Whether an individual encounters these short-term factors depends on his or her routine activities. However, in his overarching theory, Farrington does not specify hypotheses for the effects of short-term factors on different types of delinquency. In Wikström’s (2004; 2006) situational action theory, he proposed three aspects of situations that can lead to delinquency: opportunity, i.e. the presence of persons, objects or events that are necessary to carry out a delinquent action; friction, i.e. events that cause adverse reactions to other people’s behavior; and monitoring, i.e. the risk of detection and intervention. The causal mechanisms that relate to these situational aspects are temptation, i.e. a perceived option to satisfy a particular desire in a delinquent way; provocation, i.e. a perceived attack on a person’s (or his or her significant others) property, security or self-respect that leads to anger or similar emotions; and deterrence, i.e. the perceived risk of intervention through third parties.1 Different settings vary with the degree of temptations, provocations and deterrence available. In the context of unstructured socializing with peers, deterrence is reduced because no one is responsible for social control. This is expected to lead to a higher risk for all types of delinquency. Other aspects are different for the three delinquent acts of interest: For shoplifting, temptations in the form of material goods displayed in stores and shopping centers are present in public places, or more specifically in shopping areas. Friends are useful
resources for shoplifting as they can serve as lookouts or divert staff’s attention. Staying in public space and near public amenities is a necessary precondition for vandalism. In certain cases, perceived “provocation” in the form of defective facilities (i.e. vending machines) can increase the risk for vandalism. For assault, the main situational mechanism we expect is provocation: spending time in public spaces enhances the risk of encountering others who are perceived to attack one’s property, security or self-respect. Furthermore, being accompanied by friends increases this risk because a perceived attack on one group-member potentially provokes all friends in the group. But also, in certain situations, peers in one’s own group can constitute a source of provocation. In addition, a reaction to a perceived provocation is more likely if others who approve of a coercive action witness the event (Tedeschi and Felson 1994). Thus, it is reasonable to assume that unstructured socializing with peers relates positively to shoplifting, vandalism and assault, albeit the underlying mechanisms may be distinct for each of the different types of delinquency.

PRIOR RESEARCH

Several studies have established a link between unstructured socializing and delinquency (e.g. Anderson and Hughes 2009; Barnes et al. 2007; Hawdon 1999; Haynie and Osgood 2005; Mahoney and Stattin 2000; Osgood et al. 1996). Most research has been carried out in the United States, but studies from other countries (e.g. Bernburg and Thorlindsson 2001 for Iceland; Mahoney and Stattin 2000 for Sweden; Raabe, Titzmann, and Silbereisen 2008 for Germany; Vazsonyi et al. 2002 for a cross-national design) suggest that this relationship exists across different national contexts. The present literature covers different age groups, from nine year-old children (Posner and Vandell 1999) to 26 year-old adults (Osgood et al. 1996).
Differential effects on distinct delinquency types

Most of the studies delving into the relationship between unstructured socializing and delinquency used composite measures of delinquency or behavior problems (e.g. Mahoney and Stattin 2000; Osgood et al. 1996). A few scholars distinguished between property offending and violence. They reported that unstructured socializing had a significant effect on both (Anderson and Hughes 2009; Bernburg and Thorlindsson 2001). Similarly, Wikström and Butterworth (2006) found a positive relationship between lifestyle risk (i.e. delinquent peers, time in high risk public environments, alcohol/drug use) and the frequency of different offenses (i.e., serious thefts, shoplifting and aggressive crimes). Further, Wong (2005) reported that spending time with friends, doing nothing and dating were related to violent, property and trivial offenses. In contrast, a recent study by Miller (2012) showed that time spent hanging around locally with friends was associated with assault, shoplifting, and vandalism. However, time spent hanging around away from home with friends was associated with assault, fare evasion and drug use. In sum, most existing research suggests that the effects of unstructured socializing do not differ across different types of delinquency. Yet, all available studies are cross-sectional and cannot rule out that selection effects differ between types of delinquency.

The problem of self-selection

Some researchers have raised concerns about possible selection effects into unstructured socializing (Haynie and Osgood, 2005; Mahoney and Stattin, 2000). Adolescents with certain risk factors for delinquency could be more likely to be involved in unstructured socializing. It is also possible that adolescents with pre-existing delinquency choose unstructured socializing in order to commit delinquent acts more easily (Agnew and Petersen 1989; Hawdon 1996). Different approaches have been used to deal with selection. One option is to control for previous delinquency when examining current delinquency outcomes. This
allows control of prior unmeasured influences on current delinquency, including possible selection effects (Menard 2010). A rigorous version of this approach was employed by Osgood and his collaborators (1996). They used five waves of longitudinal data on unstructured socializing and delinquency in a fixed-effects model and focused solely on within-individual changes in deviant behavior. This method controls for all stable differences between individuals that might predict who is more likely to spend their leisure time with unstructured socializing (Osgood, Anderson, and Shaffer 2005). Osgood and his colleagues (1996) concluded that, adjusted for selection effects, changes in unstructured socializing are still closely related to changes in delinquency. Other researchers have used two waves of data and controlled for delinquency at time 1 when modeling delinquency at time 2. Their results suggest that the relationship between unstructured socializing and self-reported delinquency (Haynie and Osgood 2005), violent behavior (Maimon and Browning 2010) and externalizing problems (Mahoney, Stattin, and Lord 2004; Pettit, Bates, Dodge, and Meece 1999) is robust, even if previous measures of the respective outcomes are taken into consideration. In sum, the existing research suggests that the relation between unstructured socializing and delinquency is supported when controlling for prior delinquency, and that this relationship cannot be attributed exclusively to selection effects. Nevertheless, this does not preclude the existence of selection effects.

**Shared risk factors for unstructured socializing and delinquency**

To gain more insight into possible selection mechanisms, some researchers investigated whether delinquency and unstructured socializing share common risk factors. Gottfredson and Hirschi (1990: 157) proposed this relationship for low self-control: “People who lack self-control tend to dislike settings that require discipline, supervision, or other constraints on their behavior; such settings include school, work, and, for that matter, home. These people therefore gravitate to ‘the street’ or, at least in adolescence, to the same-sex peer
group.” In that regard, Maimon and Browning (2010) found that impulsivity was a significant longitudinal predictor for unstructured socializing, while Osgood and Anderson (2004) reported a cross-sectional association of individual risk seeking tendencies with school rates of unstructured socializing. A few scholars have examined other risk factors for unstructured socializing, mainly focusing on parenting practices. Individual and school rates of parental monitoring were significant cross-sectional predictors of school rates of unstructured socializing (Osgood and Anderson 2004). Mahoney, Stattin and Lord (2004) discovered that the individual-level relationship also persisted longitudinally, though only for males: parental knowledge of boy’s activities and voluntary disclosure of their whereabouts both predicted lower participation in unstructured youth recreation centers, despite controlling for prior antisocial behavior and prior youth center participation. Furthermore, deviant peers (Maimon and Browning 2010) and moral values favorable to violence (Bernburg and Thorlindsson 2001) have been shown to relate positively to unstructured socializing in cross-sectional research. Summarizing these findings, we conclude that it is very likely that several risk factors for delinquency are also risk factors for unstructured socializing. The present paper examines for a range of established risk factors for delinquency (Ribeaud and Eisner 2010; Wikström and Butterworth 2006) whether they are also related to unstructured socializing.

**Previous problem behavior and unstructured socializing**

Apart from shared risk factors, previous delinquency or behavior problems could also have direct effects on later involvement in unstructured socializing. Findings on these issues are mixed. In a longitudinal study, Fleming and his team (2008) reported effects of school misbehavior in the sixth grade (age 12) on the participation in unstructured activities in the seventh grade (age 13). They found that this relationship did not replicate between the seventh and the eighth grades, nor between the eighth and the ninth grades. Also Goldstein, Davis-
Kean and Eccles (2005) reported no effect of problem behavior in the seventh grade (mean age 12.7) on unsupervised socializing at the eighth grade (mean age 14.2).

Other researchers have controlled for previous involvement in leisure activities, thus focusing on changes in activity patterns (Finkel 1995). Mahoney, Stattin and Lord (2004) found evidence that male antisocial behavior at age 14 predicted involvement in unstructured youth recreation centers at age 15. Posner and Vandell (1999) revealed that children with behavior problems in the third grade (age 9) were more likely to take part in outside unstructured activities in the fifth grade (age 11). However, the relationship was less pronounced for Caucasian than for African-American children. McHale and collaborators (2001) found no association between conduct problems at age 10 and time spent unsupervised with peers at age 12. But they did find a relationship between conduct problems and time spent socializing (with or without peers) at age 12. Taken together, these findings suggest that there might be certain selection effects of children and adolescents who showed problem behavior into unstructured socializing. But these effects seem limited to certain groups of adolescents and certain developmental stages.

The goals of our study are first to examine selection effects into unstructured socializing more closely. We address two points: a) whether risk factors for delinquency are also risk factors for unstructured socializing and b) whether adolescents who committed different types of delinquency in the past are more likely to spend their time in unstructured socializing with peers in the future. Second, we consider the relationships between unstructured socializing and different types of delinquency. That is, we assess whether unstructured socializing has specific effects on shoplifting, vandalism, assault and a variety measure of delinquency, while controlling for prior involvement in the same type of delinquency.
METHOD

Data

Participants and Procedures

The present analyses rely on data from the Zurich Project on the Social Development of Children and Youths (z-proso). z-proso is a combined longitudinal and intervention study of about 1300 children in the city of Zurich, Switzerland. The study uses a cluster-randomized sample of 56 out of 90 schools, stratified by school size and socio-economic background of the school district. The target sample was all 1675 children who in 2004, entered first grade in one of those schools (for a detailed overview see Eisner and Ribeaud 2005; Eisner, Ribeaud, Jünger, and Meidert 2008). The initial participation rate for children was 81% (N = 1361). Thus far, five waves of data collection with children, parents and teachers have been conducted. For the present study, we analyzed adolescents’ self-reports from Wave 4, referred to as Time 1 (T1, mean age 11.3 years), and Wave 5, referred to as Time 2 (T2, mean age 13.7 years). Most of the participants transitioned from primary to secondary school during this time interval. The participation rate was 69% (N = 1148) at Time 1 and 82% (N = 1366) at Time 2. Data collection took place in early 2009 and summer 2011 in schools, but outside of school hours. Guided by study staff, the participants completed a written questionnaire in a group setting. For their participation, respondents received a cash incentive.

Measures

Delinquency. Four self-reported delinquency outcomes were considered in the analysis: shoplifting, vandalism, assault and a variety measure of delinquency. All variables were measured with identical prevalence questions at Time 1 and 2. For shoplifting, two items were included: “stolen something in a store or at a newsagent that was worth less than 50 Swiss francs” or “stolen something in a store or at a newsagent that was worth more than 50 Swiss francs”. The item for vandalism was “damaged windows, phone booths, street lamps, seats in
the tramway, train or bus or similar things on purpose”. Assault was based on the item: “hit, kicked or cut someone on purpose so that this person was injured”. The measures for these separate delinquent acts are dichotomous, where a score of 1 indicates that the respondent has committed the particular delinquent act at least once in the past 12 months, while a 0 indicates no involvement that type of delinquency. The variety measure sums up the dichotomous measures for shoplifting, vandalism and assault. It ranges from 0 to 3 and indicates how many different types of delinquency an adolescent has committed in the past 12 months.

Unstructured socializing. Four items were used to assess unstructured socializing with peers: “Meet friends in a flat where no adults are present”, “go to a party in the evening without parents”, “hang around with friends and have fun in a park, at a public transport station or in a shopping mall in the afternoon” and “hang around with friends and have fun in a park, at a public transport station or in a shopping mall in the evening”. Answers were given on a five-point Likert scale ranging from “never” to “(almost) daily”. The scale yields a satisfying reliability (T1: $\alpha = .744$, T2: $\alpha = .755$).

Gender (male = 1; female = 0) was controlled in all models. The sample consists of 51.1% boys and 48.9% girls.

Low self-control. Low self-control was assessed with a 10-item adapted version (Longshore, Turner, and Stein 1996) of the Grasmick-scale (Grasmick, Tittle, Bursik, and Arneklev 1993). Five subdimensions were covered: impulsivity, risk seeking, preference for physical activity, self-centeredness and volatile temper. Answers were given on a four-point Likert scale ranging from “strongly disagree” to “strongly agree”. High values correspond to low self-control. Although the scale was originally developed for adults, it provides a consistent measurement (T1: $\alpha = .753$, T2: $\alpha = .779$) when used for adolescents.
Moral values. Two written scenarios were used to assess moral values. Respondents were asked how bad they would find a) hitting a child in the face after a verbal provocation and b) threatening a child to get his/her mobile phone. Answers were given on a four-point Likert scale from ranging from “not bad at all” to “very bad”. High values on the scale correspond to moral values opposed to delinquency. Because the scale consisted of only two items, internal consistency is rather low (T1: $\alpha = .499$, T2: $\alpha = .479$).

Poor parental monitoring. Following Stattin and Kerr (2000) parental monitoring was measured using only items that referred to parental monitoring activities and not to general parental knowledge of their children’s whereabouts. Respondents assessed whether parents asked where they went during their leisure time and if parents set a time to return when they went out. Answers were recorded on a four-point Likert scale ranging from “never” to “often or always”. We reversed the polarity of both items; high values on the scale indicate poor parental monitoring. The scale has a rather low internal consistency (T1: $\alpha = .483$, T2: $\alpha = .540$).

Delinquent best friends. All respondents were asked to name their two best friends and to give information on their deviant behavior. In a yes/no-format, we asked whether in the last year the friend hit or kicked and hurt another child, shoplifted, was truant, drank alcohol, smoked cigarettes or used drugs. The information was used to create a dichotomous peer delinquency variable ($1 = $ one or both friends had committed at least one of the mentioned actions).

School attachment. Two aspects of school attachment were considered: whether the respondent liked school and found it useful (e.g. “I like going to school.”) and whether the respondent felt supported and got along well with his or her teacher (e.g. “My teacher treats
me fairly.”). Answers were recorded on a four-point Likert scale ranging from “fully untrue” to “fully true”. The six items were aggregated to a scale with good internal consistency (T1: $\alpha = .776$, T2: $\alpha = .760$).

Descriptive statistics for all variables are presented in Table 1.

<Table 1 about here>

**Analyses**

*Selective attrition and treatment of missing data.* A simplified informed consent procedure led to a considerably higher participation rate at Time 2 (82%, $N = 1366$) than at Time 1 (69%, $N = 1148$). In order to assess whether respondents who participated in both measurements were significantly different from those who only participated in Time 2, an independent samples t-test was conducted. With participation at Time 1 as the grouping variable, the t-test revealed no significant difference for any of the Time 2 outcomes, predictors or control variables. Therefore, our analyses included all respondents who participated at Time 1 and 2, resulting in a sample of $N = 1032$.

The variable for best friends’ delinquency contained a total of 6.4% missing values at Time 1 and 3.8% at Time 2. Values for unstructured socializing were missing in 2.9% of the cases at Time 1 and in 1.3% of the cases at Time 2. For the remaining variables, the share of missing values was less than 1%. Little’s MCAR test suggested that the pattern of missing data was not completely random ($\chi^2 (155, N = 1032) = 230.11, p = .000$). To retain all cases in the analyses, we imputed all missing values with the multiple imputation by chained equations procedure in Stata 12 (Royston 2005; 2007; 2009; StataCorp. 2011). We included all independent and dependent variables at Time 1 and 2 to compute 20 imputed datasets (Schafer and Graham 2002; Young and Johnson 2010). The variety measure of delinquency was specified as a passive variable. A measure for self-reported school difficulties at Time 2 was added to the imputation model because we assumed that missing values in the second
part of the questionnaire were likely to be related to school and concentration problems of the respondents. All statistical models presented in this paper are based on the imputed data. The reported scale properties and descriptive statistics are based on complete cases.

*Intervention groups.* In the course of the study, participants were randomly assigned to one of four treatment conditions: the first group composed of children who received a social competence training; in the second group parents were offered a parenting course; the third group took part in both the social competence training and the parenting course; the fourth group was a control group without treatment (Eisner and Ribeaud 2005). To control for possible treatment effects, all statistical models were first calculated with intervention dummies included. There was no significant treatment effect for any of the outcomes. To obtain a simpler model, the intervention variable was excluded from the reported analyses.

*Clustering by school.* Sampling for the present study was cluster-randomized by school with an initial sample of 56 schools. But by Time 2, because of relocations and class changes, participants were dispersed to 190 schools. To assess for deviations from the assumption of independent observations, intraclass correlations (ICC) were computed for each Time 2 outcome. Unstructured socializing was moderately clustered by school, $ICC = 0.088$, $SE = 0.031$, 95% CI [0.028, 0.148], $N = 1011$, the clustering was lower but significant for shoplifting, $ICC = 0.054$, $SE = 0.027$, 95% CI [0.002, 0.107], $N = 1027$, vandalism, $ICC = 0.057$, $SE = 0.027$, 95% CI [0.004, 0.109], $N = 1025$, and the variety measure, $ICC = 0.086$, $SE = 0.030$, 95% CI [0.027, 0.146], $N = 1022$. There was no significant clustering for assault, $ICC = 0.020$, $SE = 0.023$, 95% CI [0.000, 0.065], $N = 1025$. For all clustered outcomes, we repeated the analyses with robust standard errors adjusted for clustering by school (Rogers 1993). With one exception that we will discuss below, these
analyses led to the same substantive conclusions. The final results are therefore presented without controlling for clustering.

*Analytic strategy.* In a first step, we used lagged linear regression models to examine selection effects into unstructured socializing. Two types of models were compared: First, we examined effects on the *level* of unstructured socializing at Time 2. To this end, unstructured socializing at Time 2 was regressed on both Time 1 risk factors for delinquency and on different types of delinquency (i.e. shoplifting, vandalism and assault). Second, we focused on the *change* in unstructured socializing between Time 1 and 2. We therefore adjusted our analysis for unstructured socializing at Time 1 (Finkel 1995). In a second step, the effects of unstructured socializing on shoplifting, vandalism and assault were assessed in separate logistic regression models. To establish the effects on the variety of delinquency, a Poisson model was used. Because unstructured socializing is regarded as a situational opportunity for delinquency within the routine activity framework, the opportunities in one time period affect the outcome in the same time period (Hay and Forrest 2008). We therefore used concurrent, lagged dependent variable models that controlled for delinquency at Time 1 to account for prior unmeasured influences on delinquency (Menard 2010). For data handling and descriptive analyses, we used IBM SPSS Statistics19 (SPSS Inc. 2010), while multivariate analyses were performed in Stata 12 (StataCorp. 2011).

**RESULTS**

**Descriptive statistics**

In Table 1, we present descriptive statistics for all model variables. The percentage of adolescents who shoplifted or vandalized public facilities in the last 12 months almost doubled between Time 1 and 2. While 6.9% of the respondents reported shoplifting at Time 1, this figure increased to 13.3% at Time 2. The share of respondents who reported vandalism
increased from 3.4% at Time 1 to 7.2% at Time 2. For both types of delinquency, this increase was highly significant. Assault, however, remained at the same level, where 10.4% of the respondents reported assault at Time 1; it was 10.0% at Time 2. The mean value on the variety measure of delinquency increased significantly from 0.207 to 0.305 different types of delinquency reported. Unstructured socializing increased significantly between Time 1 and 2, as did low self-control and poor parental monitoring. The share of adolescents who had one or two delinquent friends rose from 32.5% to 51.3%, whereas protective factors such as moral values opposed to delinquency and attachment to school decreased.

Selection into unstructured socializing

First, we were interested in factors that predicted unstructured socializing in early adolescence. Results of multivariate linear regression models are shown in Table 2. In Model I, we regressed unstructured socializing at Time 2 on different Time 1 risk factors to assess lagged effects on the level of unstructured socializing. In Models IIa to IId, we also included different types of prior delinquency to examine if they had an additional effect, once the risk factors were taken into account.

The results presented in Model I indicate that several risk factors for delinquency were related to unstructured socializing as well. Adolescents who exhibited low self-control, who were poorly monitored by their parents or had one or two delinquent best friends at Time 1 were at a higher risk for unstructured socializing at Time 2. But possessing moral values opposed to delinquency had a protective effect. Gender or attachment to school was not related to unstructured socializing, once the other risk factors were taken into account. The explained variance for this model was low, where the predictors accounted for only about 6% of the variance in unstructured socializing.
In Models IIa to IIc, different types of prior delinquency were introduced as predictors. The results suggest that different types of delinquency had different effects on involvement in unstructured socializing two years later: Adolescents who reported acts of vandalism at Time 1 had a .483 higher value \( (p = .008) \) on the measure of unstructured socializing at Time 2. At the same time, there was no indication of such a relationship for shoplifting or assault. In Model IId, the variety measure of delinquency was introduced. For every additional type of delinquency reported at Time 1, the measure of unstructured socializing increased by .174 \( (p = .009) \) at Time 2. Thus, there was indication of an effect of delinquency on unstructured socializing that goes beyond shared risk factors. However, this effect was small and it was not observed for all types of delinquency. The effects of the other risk factors somewhat decreased when prior delinquency was included in the models. With about 7%, the amount of explained variance remained low.

Secondly, we focused on changes in unstructured socializing between the two measurement points. Table 3 shows statistical models that controlled for unstructured socializing at Time 1.

<Table 3 about here>

In Model I, risk factors for delinquency were assessed. Unstructured socializing at Time 1 had the strongest effect of all predictors \( (b = .378, p = .000) \). The inclusion of this stability effect increased the share of explained variance to about 16%. This result indicates that unstructured socializing is a relatively stable characteristic of adolescents’ leisure time arrangements. Nevertheless, adjusted for previous levels of unstructured socializing, association with delinquent friends predicted a significant increase in unstructured socializing between Time 1 and Time 2.

In Model IIa to IIc, the different types of previous delinquency were introduced. Only vandalism at Time 1 had a significant effect on unstructured socializing at Time 2. However,
the significance test for the coefficient of vandalism \((b = .352, p = .041)\) was close to a threshold of 5%. If robust standard error for clustering within schools were employed, this coefficient was not significant anymore \((b = .352, p = .062)\), suggesting that the effect of vandalism may be spurious in this analysis. Model II\(d\) shows that the variety measure of delinquency at Time 1 had no additional effect on unstructured socializing, once previous unstructured socializing and other risk factors for delinquency were taken into consideration.

Overall, the results suggest that several risk factors for delinquency affect the selection into unstructured socializing. In part, this selection process takes place before the age of 11. Once the level of unstructured socializing at 11 was taken into account, only associating with delinquent best friends predicted a further increase in unstructured socializing. The analyses for direct effects of previous delinquency on unstructured socializing led to inconsistent results. While prior vandalism and variety of delinquency had an effect on later levels of unstructured socializing, these effects disappeared when controlling for previous unstructured socializing.

**Unstructured socializing and delinquency**

To assess the effects of unstructured socializing on different types of delinquency, we employed a concurrent, lagged dependent variable model. In this model we controlled for the outcome variable measured at Time 1 to account for unmeasured influences on delinquency. To examine factors related to the separate types of delinquency at Time 2, logistic regression models were employed. For the prediction of the variety measure of delinquency, we used Poisson regression.\(^4\)

<Table 4 about here>

Models Ia to Ic in Table 4 present results from regression models predicting shoplifting, vandalism and assault. The lagged dependent variable had a significant effect on
most outcomes. Adolescents who shoplifted at Time 1 had 3.2-times had higher odds for shoplifting at Time 2, while adolescents who committed vandalism at Time 1 had 4.1-times higher odds for vandalism at Time 2. For assault, the Odds Ratio of the stability effect exceeded 1 but did not reach statistical significance \( p = .070 \). Unstructured socializing related only to changes in shoplifting and vandalism: For each one-unit increase on the measure for unstructured socializing, the odds for shoplifting and vandalism increased by a factor of 1.4. Contrary to our hypothesis, we found that no such relationship existed for assault: Adolescents who spent more leisure time in unstructured socializing had no higher risk for assault. Other significant risk factors for all types of delinquency included low self-control and delinquent best friends. Moral values opposed to delinquency had a protective effect against delinquent involvement. School attachment had a protective effect for vandalism and assault, while being marginally significant for shoplifting \( p = .056 \). In Model Id, Poisson regression results for the variety measure of delinquency are presented. The findings were similar to the ones obtained from the separate measures of each delinquency type. Each additional type of delinquency reported at Time 1 increased the expected count on the measure by a factor of 1.2. Further, each one-unit increase in unstructured socializing led to a 1.2-times higher expected count on the variety measure. For adolescents with a mean value on unstructured socializing, the expected count on the variety measure was 0.149, while for adolescents who were one standard deviation above the mean, it was 0.174. The effect was therefore not very strong.

**DISCUSSION**

In this study, we investigated the relations between unstructured socializing and delinquency in early adolescence. Based on longitudinal data, we studied a variety measure of delinquency and three different types of delinquency: shoplifting, vandalism and assault. Initially, we examined the selection of adolescents into unstructured socializing. Three main
results emerged: First, our findings indicated that unstructured socializing and delinquency share several common risk factors. Adolescents who exhibited low self-control were poorly monitored by their parents, had moral values in favor of delinquency and had delinquent best friends at the age of 11 were more likely to spend their leisure time on unstructured socializing two years later. This corroborates previous research on risk factors for unstructured socializing that supports longitudinal effects of impulsivity (Maimon and Browning 2010). Effects of moral values (Bernburg and Thorlindsson 2001) and delinquent peers (Maimon and Browning 2010) on unstructured socializing have only been established in cross-sectional research so far. We show that they are robust in a longitudinal design. Second, we find that some types of previous delinquency affected later unstructured socializing, even when other risk factors were taken into account. Our results indicate that adolescents who reported vandalism or had a higher variety of delinquency at the first measurement were more likely to spend their leisure time on unstructured socializing two years later. In contrast, shoplifting or assault was not associated with a higher risk of later unstructured socializing. Some previous research has found age-specific selection effects for a wider indicator of problem behaviors (Fleming et al. 2008), while other researchers have found no effect, once controlling for additional risk factors (Goldstein, Davis-Kean, and Eccles 2005). To our knowledge, effects of different types of delinquency on selection into unstructured socializing have not been investigated. One possible interpretation of our finding is that prior vandalism has a genuine effect on future unstructured socializing because adolescents who have already vandalized public facilities specifically look out for opportunities to vandalize again and therefore prefer leisure settings without guardians. However, this does not explain why we observed a similar effect of variety of delinquency and why this effect is absent for adolescents who reported shoplifting or assault. Another plausible interpretation emerges if we focus only on adolescents who reported at least one type of delinquency at Time 2. We find that adolescents who reported vandalism at Time 1 have a significantly higher value on
the variety measure of delinquency at Time 2 than adolescents who reported shoplifting or
assault. It is thus possible that vandalism is simply a proxy for stronger involvement in
delinquency and that the strength of involvement and not this particular type of delinquency
relates to future unstructured socializing. With this in mind, further research should employ
different indicators for delinquency involvement to further clarify this relationship. Third, we
find that unstructured socializing at Time 1 was the most important predictor for unstructured
socializing at Time 2. This finding suggests that selection into unstructured socializing takes
place at an early age. The effects of low self-control, poor monitoring and moral values on
unstructured socializing were not significant anymore once previous unstructured socializing
was included. On the other hand, delinquent best friends seemed to foster an increase in
unstructured socializing in early adolescence, even if previous levels of unstructured
socializing were taken into account. Apart from a possibly spurious effect of vandalism,
which became non-significant once clustering by school was accounted for, we found no
effects of previous delinquency on unstructured socializing. Other researchers found that
broader measures of antisocial behavior predicted an increase in unstructured socializing,
accounting for previous levels of unstructured socializing (Mahoney, Stattin, and Lord 2004;
McHale, Crouter, and Tucker 2001; Posner and Vandell 1999). However, none of these
studies controlled for delinquent friends, which may explain the diverging results. In sum, our
findings have shown that unstructured socializing is related to several risk factors for
delinquency. It is therefore important that researchers control other risk factors for
delinquency if they want to examine the effects of unstructured socializing on delinquency,
especially in cross-sectional designs.

A second aim of the present study was to examine how unstructured socializing relates
to different types of delinquency in an early adolescent sample. Three main findings emerged:
First, we conclude that unstructured socializing with peers constitutes a risk factor for variety
of delinquency. This is in line with other longitudinal studies that use combined delinquency outcomes (e.g. Fleming et al. 2008; Haynie and Osgood 2005; Mahoney, Stattin, and Lord 2004; Osgood et al. 1996). Second, the results for different types of delinquency diverged. Unstructured socializing had an effect on shoplifting and vandalism, but not on assault. This is not in line with findings of other researchers who reported a relationship of unstructured socializing with property and violent offending (Anderson and Hughes 2009; Bernburg and Thorlindsson 2001; Wikström and Butterworth 2006), or with violent behaviors (Maimon and Browning 2010; Miller 2012). A possible explanation for this divergence is the young age of our study sample. Additional analyses showed that only about half of the adolescents who reported assault indicated that their last assault had taken place in a public or semi-public context (e.g. public transport station). The other half of the incidences took place at home or at school. This result is likely age-specific for early adolescents who spend more time with their family than older youths. The tendency to report incidents at home might have been augmented by the examples given in the questionnaire. They mentioned incidents at school, at sports grounds or entertainment places, but also explicitly referred to victims “at home such as a brother or sister or a parent”. This stands in contrast to the vandalism question, which was focused on incidents in public space, with examples such as “phone booths, street lights, seats in tramways, trains or busses”. Vandalism is therefore expected to relate to unstructured socializing more closely. The same argument applies to shoplifting that necessarily takes place in (semi-)public surroundings. Lastly, we find that adolescents whose best friends were delinquent had a higher risk for all types of delinquency and for unstructured socializing. This suggests that delinquent friends have direct and indirect effects on delinquency.

There are several limitations to our study. First, the statistical models employed did not predict unstructured socializing well. One possible explanation for this shortcoming is the time gap of more than two years between the measurement of the risk factors and the
outcome. This interval might be too long in early adolescence, which is characterized by rapid changes in activity patterns. Thus, our results should be reexamined with measurements in shorter time intervals. Furthermore, additional factors from the individual, family or school domain may improve the prediction of unstructured socializing. Second, our measure for unstructured socializing was not very precise. While we capture the presence of peers and the absence of authority figures, we cannot differentiate in which surroundings socializing takes place. For the study of opportunity structures it is yet important whether adolescents hang out in a park, at a public transport station or in a shopping mall. Recent research has shown that the consequences of spending unstructured time with peers are likely contingent on contextual characteristics. In safe and well-monitored neighborhoods, the effect of unstructured socializing on violent behavior (Maimon and Browning, 2010) and on externalising problem behavior, decreases (Pettit, et al., 1999). Future research should investigate in detail the characteristics of the social and spatial contexts in which adolescents spend their time. Third, when studying the association between unstructured socializing and delinquency, one assumes that delinquent acts are committed during the time spent on unstructured socializing. This assumption has rarely been tested. Even though a study that works with a detailed spacetime budget reports that 65% of delinquent acts were committed while young people were socializing with their peers unsupervised (Wikström, et al., 2010), this leaves a considerable share of delinquent acts that might be committed in other settings. More precise information about the situational circumstances of delinquent acts is therefore desirable. This is especially important if one wants to look at different types of delinquency. Fourth, since we rely on self-reported data only, our analyses may suffer from same source bias. This could be especially problematic for the ratings of parenting and for the measures on delinquent friends. Because subjects tend to project their own attitudes and behavior onto their friends (Haynie and Osgood 2005), the influence of friends’ delinquency could be overestimated in our research.
Our research provides evidence that adolescents with delinquency risk factors are more likely to select unstructured socializing. At the same time, we find that unstructured socializing is a genuine risk factor for most types of delinquency. Future research should therefore take both mechanisms into account. This study allows some insights into the relationships between unstructured socializing and different types of delinquency. As there is little knowledge on these relations so far, more research with different samples and more precise contextual measurements is desirable. In addition, a closer examination of the assumed causal paths could help to unravel the distinct mechanisms that link unstructured socializing with different types of delinquency.
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Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to research, authorship, and/or publication of this article.

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References


Table 1: Descriptive statistics for model variables

<table>
<thead>
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<th>Variable</th>
<th>n</th>
<th>Time 1</th>
<th>SD</th>
<th>Time 2</th>
<th>SD</th>
<th>Δ Time 1 and 2</th>
<th>t⁰</th>
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</thead>
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<td>.254</td>
<td>.133</td>
<td>.340</td>
<td>.064</td>
<td>5.58***</td>
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<tr>
<td>Vandalism (0/1)</td>
<td>1020</td>
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<td>.182</td>
<td>.072</td>
<td>.258</td>
<td>.037</td>
<td>4.34***</td>
</tr>
<tr>
<td>Assault (0/1)</td>
<td>1024</td>
<td>.104</td>
<td>.305</td>
<td>.100</td>
<td>.300</td>
<td>–.004</td>
<td>–0.32</td>
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<td>.528</td>
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<td>.645</td>
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<td>.942</td>
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<td>.680</td>
<td>19.22***</td>
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<td>.500</td>
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<td>1.204</td>
<td>.467</td>
<td>.254</td>
<td>16.45***</td>
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<td>–10.99***</td>
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<td>.541</td>
<td>.578</td>
<td>.652</td>
<td>.198</td>
<td>8.81***</td>
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<td>.513</td>
<td>.500</td>
<td>.187</td>
<td>9.14***</td>
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<td>1.883</td>
<td>.541</td>
<td>–.340</td>
<td>–18.41***</td>
</tr>
</tbody>
</table>

Note. Analyses are based on cases with valid values on the respective measure at both points in time.
*One-tailed, paired sample t-test.
*p < .05, **p < .01, ***p < .001.
<table>
<thead>
<tr>
<th></th>
<th>Model I</th>
<th>Model IIA</th>
<th>Model IIB</th>
<th>Model IIC</th>
<th>Model IIa</th>
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<tr>
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<td>Coef</td>
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<td>Coef</td>
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<td>-.101</td>
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<td>.079</td>
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<tr>
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<td>-.138*</td>
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<td>.155*</td>
<td>.060</td>
<td>.138*</td>
</tr>
<tr>
<td>Delinquent best friends T1</td>
<td>.244**</td>
<td>.080</td>
<td>.233**</td>
<td>.080</td>
<td>.226**</td>
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<td>Shophlifting T1</td>
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<td>.131</td>
<td>.483**</td>
<td>.181</td>
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<td>Vandalism T1</td>
<td></td>
<td></td>
<td></td>
<td>.483**</td>
<td>.181</td>
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<td>Assault T1</td>
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<td></td>
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<td>Variety of delinquency T1</td>
<td></td>
<td></td>
<td></td>
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<td>Constant</td>
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<td>.245</td>
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<td>.064</td>
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<td>.063</td>
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</table>

Note. Multivariate OLS regression, $N = 1032$. Mean $R^2$ and mean adjusted $R^2$ are computed with Fisher’s $z$-transformation. *$p < .05$, **$p < .01$, ***$p < .001$. 
Table 3: Unstructured socializing at Time 2 regressed on unstructured socializing and risk factors at Time 1

<table>
<thead>
<tr>
<th></th>
<th>Unstructured Socializing T2 (Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model I</td>
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<td></td>
<td>Coef</td>
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<tr>
<td>Low self-control T1</td>
<td>.144</td>
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<tr>
<td>Moral values T1</td>
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<tr>
<td>Poor monitoring T1</td>
<td>.027</td>
</tr>
<tr>
<td>Delinquent best friends T1</td>
<td>.193*</td>
</tr>
<tr>
<td>School attachment T1</td>
<td>.033</td>
</tr>
<tr>
<td>Shoplifting T1</td>
<td></td>
</tr>
<tr>
<td>Vandalism T1</td>
<td></td>
</tr>
<tr>
<td>Assault T1</td>
<td></td>
</tr>
<tr>
<td>Variety of delinquency T1</td>
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<td>Constant</td>
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<tr>
<td>Mean R²</td>
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</tr>
<tr>
<td>Mean adjusted R²</td>
<td>.156</td>
</tr>
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</table>

Note. Multivariate OLS regression. N = 1032. Mean R² and mean adjusted R² are computed with Fisher’s z-transformation. *p < .05, **p < .01, ***p < .001.
Table 4: Shoplifting, vandalism, assault and variety of delinquency at Time 2 regressed on unstructured socializing at Time 2

<table>
<thead>
<tr>
<th></th>
<th>Shoplifting T2&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Vandalism T2&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Assault T2&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Variety of delinquency T2&lt;sup&gt;b&lt;/sup&gt;</th>
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<tbody>
<tr>
<td></td>
<td>OR</td>
<td>SE</td>
<td>OR</td>
<td>SE</td>
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<tr>
<td>Unstructured</td>
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<td>.154</td>
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<td>.202</td>
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<td>Male gender</td>
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<tr>
<td>Moral values T2</td>
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<td>.481**</td>
<td>.105</td>
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<tr>
<td>Delinquent best friends T2</td>
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<td>1.038</td>
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<td>1.640</td>
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<td>School attachment T2</td>
<td>.665</td>
<td>.142</td>
<td>.573*</td>
<td>.158</td>
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<td>Shoplifting T1</td>
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<td>–</td>
<td>–</td>
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<tr>
<td>Vandalism T1</td>
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<td>–</td>
<td>4.142**</td>
<td>1.798</td>
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<tr>
<td>Assault T1</td>
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<td>Variety of delinquency T1</td>
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<td>.020</td>
<td>.034**</td>
<td>.033</td>
</tr>
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</table>

Note. N = 1032. OR = Odds ratio, IRR = Incidence rate ratio.
<sup>a</sup> Results from logistic regression. <sup>b</sup> Results from Poisson regression.
*p < .05, **p < .01, ***p < .001.
Note that Wikström (2004; 2006) proposes an interaction between a person’s crime propensity (i.e. morality and self-control) and the characteristics of settings. This aspect is not further evaluated in the present paper.

Starting in Wave 5 of the study, local law permitted us to obtain passive instead of active consent of participants’ caregivers. This resulted in a considerably higher participation rate for the adolescents.

In analyses not shown we estimated all models with listwise deletion of incomplete cases. Results were similar to those based on the imputed datasets.

Various statistical procedures, such as likelihood-ratio tests and goodness-of-fit tests, are not available for multiply imputed data, because they do not have a clear interpretation when the individual analyses are pooled (StataCorp. 2011). We therefore assessed model fit for the complete case analysis. The results indicate a good fit, for the logit models. The Hosmer-Lemeshow-test was insignificant for all models. The area under the ROC-curve was .847 for the shoplifting model, .887 for the vandalism model, and .778 for the assault model. There is no indication that the variety measure of delinquency is overdispersed (Overdispersion parameter $\alpha = .087$, $p = .212$). A Poisson and a zero-inflated Poisson model showed comparable model fit (Long and Freese 2005). To facilitate interpretation, the Poisson model was employed.